2023 Prop L 5-Year Prioritization Program

Muni Maintenance, Rehabilitation, and Replacement

~~Approved: December 12, 2023~~

Draft Amendment: For Board consideration March 2025

This report was prepared by the San Francisco County Transportation Authority in coordination with the San Francisco Municipal Transportation Agency.

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1. Introduction

In November 2022, San Francisco voters approved Proposition L (Prop L), extending the ½-cent sales tax to fund transportation improvements and approving a new 30-year Expenditure Plan, which superseded the prior Proposition K Expenditure Plan. The Prop L Expenditure Plan determines eligibility for sales tax funds through a list of 28 programs. It also sets caps for the maximum amount of Prop L funds that will be available for specific programs over the 30-year Expenditure Plan period, totaling up to an estimated $2.6 billion (2020 $'s). In order to fully fund the programs, the Expenditure Plan assumes that the Prop L dollars will leverage (or match) another $23.7 billion (2020 $'s) in other federal, state, regional, and local funds for a total program cost of $26.3 billion (2020 $'s). Some of those leveraged funds will be distributed to San Francisco through funding formulas. In other cases, San Francisco project sponsors will have to aggressively compete for discretionary funds in order to fully fund the Expenditure Plan programs.

The Expenditure Plan includes a number of requirements, including the development of 5-Year Prioritization Programs (5YPPs) as a condition for receiving allocations in each program in the Expenditure Plan. The 5YPPs are intended to provide a stronger link between project selection and expected project performance, to support on time, on-budget project delivery, and optimize use of federal, state and regional matching funds. Other major benefits of the 5YPPs include:

- Provide transparency about how Prop L projects are prioritized,
- Enable public input early and throughout the planning process, and
- Improve agency coordination within and across projects at the earlier stages of the planning process.

The desired outcome of the 5YPPs is the establishment of a strong pipeline of grant-ready transportation projects that can be advanced as soon as funds (including Prop L, federal, state, and other funds) are available. The 5YPPs are critically important to help achieve the leveraging needed to fully fund the Expenditure Plan programs.

As its centerpiece, each 5YPP contains a 5-year Program of Projects (or project list), ideally including project descriptions, schedule milestones, cost estimates, and full funding plans showing Prop L funds by fiscal year and other matching funds. The Program of Projects (project list) for Muni Maintenance, Rehabilitation, and Replacement is contained in Section 7 of this document.

5YPP Amendment. The Transportation Authority amended this 5YPP on _____ to reprogram $46,922,000 in placeholder funds available in Fiscal Years 2024/25 to 2027/28 to specific projects.

2. Eligibility and Expected Fund Leveraging

2.1 | ELIGIBILITY

Eligibility for Muni Maintenance, Rehabilitation, and Replacement as identified in the voter approved Prop L Expenditure Plan is as follows, with amounts shown in millions of 2020 dollars:

"Programmatic improvements for upgrade, rehabilitation, and replacement of Muni's capital assets, including transit and paratransit vehicles, spare parts, and onboard equipment; transit facilities and facilities-related equipment; and transit guideways and associated equipment. Eligible project types include but are not limited to the following: rail car, trolley coach, and motor coach renovation and replacement of buses with zero emission vehicles, which may include additional vehicles added to the fleet to maintain current fleet passenger capacity (e.g., if electric buses have lower passenger capacity). Rehabilitation, upgrades, and/or replacement of: existing facilities for maintenance and operations, including equipment and upgrades to support the electrification of the Muni motor coach fleet and to improve resilience to climate change; rail stations including, but not limited to, platform edge tiles, elevators, escalators, and faregates; existing rail, overhead trolley wires, signals, traction power stations, and automatic train control systems, as well as upgrades to improve resilience to climate change. The intent is to implement transit priority and reliability improvements whenever guideways rehabilitation, upgrade, or replacement projects are undertaken. Includes project development and capital costs.

Sponsor Agency: SFMTA. The first $784M is Priority 1 and the remainder is Priority 2. Total Funding: $7,934.8M; EP: $825M."

SFMTA stands for San Francisco Municipal Transportation Agency. Priority 1 funds correspond to the conservative sales tax revenue forecast and Priority 2 to the optimistic forecast.

2.2 | EXPECTED FUND LEVERAGING

Leveraging Prop L funds against non-Prop L fund sources is necessary to fully fund the Expenditure Plan programs. Prop L sales tax funds will be used as seed funding for planning and project development to make projects competitive for discretionary fund sources, and to serve as local match needed to secure federal, state, regional, and other grant funding.

Based on Priority 1 (conservative forecast) funding levels, for Muni Maintenance, Rehabilitation, and Replacement, the Prop L Expenditure Plan assumes that for every

$1 of sales tax revenue spent, on average it would be leveraged by about $9 in non-Prop L funds. The Transportation Authority reviews leveraging at the project and project phase (e.g. planning, design, construction) levels as well as for each Expenditure Plan program as a whole.

3. Public Engagement

Transportation Authority staff conducted public engagement to inform the development of the 5YPPs. This section summarizes feedback heard from that engagement, as well as information provided by project sponsors regarding public engagement and community support.

During the Prop L Expenditure Plan development, the Transportation Authority conducted a robust outreach process from Spring 2021 – Winter 2022. The New Expenditure Plan for San Francisco's Half-Cent Sales Tax for Transportation: Outreach Findings report can be found on the Transportation Authority website. Key themes emerged from this process including the critical need to improve transit and invest in reliability improvements for Muni.

As part of development of the 2023 5YPPs, the Transportation Authority conducted outreach and hosted public meetings to gather input about which specific projects and project types should be funded through Prop L in the next five years and to seek input on how to select projects for each Expenditure Plan program. The meetings included a virtual meeting for interested members of the former Expenditure Plan Advisory Committee who helped develop Prop L and representatives of equity-focused community-based organizations; a virtual town hall; and presentations at community group meetings, as requested. There was also an online multi-lingual survey and opportunities for public input through the Transportation Authority's website and at multiple Transportation Authority Community Advisory Committee and Transportation Authority Board meetings. The Transportation Authority website also includes a list of staff contacts to facilitate public engagement directly with project sponsors.

Key themes emerged from this process including the reiteration of the need to invest in transit and improve transit reliability. To learn more about our engagement process and findings, visit sfcta.org/ExpenditurePlan.

4. Performance Measures

Prop L requires the establishment of performance measures for each program in the Expenditure Plan. The intent is to demonstrate the system performance benefits of sales tax projects (e.g. reduced transit travel time), to ensure funds are being used cost effectively, and to inform programming of future Prop L funds, as well as programming and prioritization of other funds by the Transportation Authority (e.g. Transportation Fund for Clean Air, Prop AA Vehicle Registration Fee funds).

After reviewing San Francisco's Congestion Management Program and consulting with eligible sponsoring agencies, the Transportation Authority recommends that the following performance measures be applied to projects included in the Muni Maintenance, Rehabilitation, and Replacement 5YPP:

- Maintain average fleet age at less than 2/3 of the Federal Transit Administration (FTA) useful life standards.
- Meet or exceed mean distance between failures (MDBF) targets for relevant vehicle projects. (See https://www.sfmta.com/reports/muni-mean-distance-between-failure.)
- Maintain average age of facilities and major equipment systems, guideways and vehicles in a state of good repair and replace within life cycle standards.

5. Project Delivery Snapshot

Since this is the inaugural Prop L 5YPP, we are looking to the prior Prop K sales tax program to assess project delivery trends for similar types of projects. Project delivery for previously-funded projects is one important consideration when we evaluate project sponsors' proposed requests for Prop L funding, particularly with respect to project readiness.

As required by the Prop L Expenditure Plan, the next 5YPP update will be informed by a citywide geographic distribution of sales tax project allocations and the distribution of projects located in Equity Priority Communities and/or benefiting disadvantaged populations.

Prop K Project Delivery

The Transportation Authority has funded Muni maintenance projects since Prop B, the predecessor to Prop K, passed in 1989. Table 1 shows the Project Status of open grants under Prop K, from multiple Prop K programs that were combined into one program under Prop L.

Table 1. Prop K Project Status – Open Grants

SPONSOR	PROJECT NAME	PHASE(S) FUNDED	FY OF ALLOCATION	ALLOCATED (AS OF JULY 2023)	REMAINING BALANCE (AS OF 11/7/23)	OPEN FOR USE?
VEHICLE PROJECTS						
SFMTA	Light Rail Vehicle Procurement (EP 17M)	Construction	2014/15	$60,116,311	$12,039,654*	
SFMTA	Light Rail Vehicle Procurement (EP 17U)	Construction	2014/15	$51,545,343	$46,009,666	
SFMTA	67 40-foot and 50 60-foot Low Floor Hybrid Diesel Motor Coaches	Construction	2016/17	$4,803,692	$4,028,663	Yes
SFMTA	67 40-foot and 50 60-foot Low Floor Hybrid Diesel Motor Coaches - Warranty	Warranty	2016/17	$696,096	$696,096	
SFMTA	Replace 33 60-ft Trolley Coaches - Warranty	Warranty	2016/17	$554,000	$316,000	
SFMTA	Replace 100 40-foot Trolley Coaches - Warranty	Warranty	2016/17	$670,000	$420,000	
SFMTA	Breda LRV Overhauls	Construction	2018/19	$1,406,369	$648,751	Yes
SFMTA	Light Rail Vehicle Procurement - EP-15	Construction	2019/20	$96,661	$96,661	
SFMTA	Light Rail Vehicle Procurement - EP-17M	Construction	2019/20	$50,089,416	$21,912,322*	
SFMTA	Light Rail Vehicle Procurement - EP-17U	Construction	2019/20	$10,545,950	$10,545,950	
SFMTA	New Flyer Midlife Overhaul Phase 1	Construction	2019/20	$10,870,283	$10,870,283	
SFMTA	Rehabilitation of 5 Vintage Streetcars (EP-12)	Construction	2019/20	$374,809	$332,702	
SFMTA	Rehabilitation of 5 Vintage Streetcars (EP-17M)	Construction	2019/20	$700,788	$700,788	
SFMTA	Replace 30 30-foot Hybrid Motor Coaches	Construction	2020/21	$16,195,602	$15,882,814*	
FACILITY PROJECTS						
SFMTA	Fall Protection Systems - Presidio Division	Construction	2015/16	$706,397	$243,350	Yes
SFMTA	Fall Protection	Construction	2016/17	$11,950,000	$1,516,693*	Yes
SFMTA	Upgrade Life and Fire Safety Systems	Construction	2017/18	$1,837,137	$204,761*	Yes
SFMTA	Muni Metro East Expansion Phase 2	Planning	2018/19	$3,487,532	$1,400,512	
SFMTA	New Castro Station Elevator	Design Engineering	2019/20	$1,500,000	$167,163	Yes

SPONSOR	PROJECT NAME	PHASE(S) FUNDED	FY OF ALLOCATION	ALLOCATED (AS OF JULY 2023)	REMAINING BALANCE (AS OF 11/7/23)	OPEN FOR USE?
SFMTA	Muni Metro East Expansion Phase 2 - MME & 1399 Marin Interim Improvements	Design Engineering	2020/21	$1,899,677	$769,485	
SFMTA	Potrero Yard Modernization - Enhanced Oversight (EP-20M)	Planning	2020/21	$75,000	$75,000	
SFMTA	Potrero Yard Modernization - Professional Services Reimbursement (20M)	Planning	2020/21	$1,000,000	$1,000,000	
SFMTA	Potrero Yard Modernization - Enhanced Oversight (EP-20U)	Planning	2020/21	$75,000	$54,640	
SFMTA	Potrero Yard Modernization - Part 1 Environmental (20U)	Environmental Studies	2020/21	$302,224	$302,224	
SFMTA	Potrero Yard Modernization - Part 1 Planning (20U)	Planning	2020/21	$2,125,065	$38,733*	
SFMTA	Potrero Yard Modernization - Part 2 Environmental (20U)	Environmental Studies	2020/21	$210,985	$210,985	
SFMTA	Potrero Yard Modernization - Part 2 Planning (20U)	Planning	2020/21	$2,135,129	$2,135,129*	
SFMTA	1399 Marin Street Maintenance Facility	Design Engineering	2021/22	$6,619,800	$6,619,800	
SFMTA	Kirkland Yard Electrification	Planning	2022/23	$1,073,196	$1,073,196	
GUIDEWAY PROJECTS						
SFMTA	Radio Communications System & CAD Replacement – under warranty	Construction	2009/10	$49,119,867	$4,120,145	Yes
SFMTA	C3 Program – Integrated Systems Replacement (EP 22M)	Construction	2011/12	$13,188,082	$391,904	Yes
SFMTA	Rail Grinding	Construction	2015/16	$309,196	$82,632*	Yes
SFMTA	Cable Car Propulsion Gearboxes	Construction	2016/17	$1,280,000	$366,750	Yes
SFMTA	Cable Car Pulley Rebuild	Construction	2017/18	$280,999	$235,343	
SFMTA	Track Replacement and Upgrade - Design	Design Engineering	2017/18	$301,000	$182,518*	
SFMTA	Track Replacement and Upgrade - Construction	Construction	2017/18	$4,179,000	$4,133,894	
SFMTA	16th Street Transit Enhancements (22-Fillmore Phase 2)	Construction	2018/19	$5,600,371	$5,166,514*	Yes
SFMTA	L-Taraval Transit Enhancements (Segment B)	Construction	2018/19	$11,240,331	$11,240,331	

SPONSOR	PROJECT NAME	PHASE(S) FUNDED	FY OF ALLOCATION	ALLOCATED (AS OF JULY 2023)	REMAINING BALANCE (AS OF 11/7/23)	OPEN FOR USE?
SFMTA	L-Taraval Transit Enhancements (Segment B) - Additional Funds (Prop K)	Construction	2020/21	$4,055,032	$4,055,032	

Projects are sorted by subprogram, allocation year, then name.
*Invoice pending.

In 2016, the SFMTA went through a comprehensive process to evaluate project delivery across the entire organization. This resulted in the 2016 Project Delivery Framework and the establishment of the SFMTA Project Management Office (PMO). As part of overseeing a program of continuous improvements to project delivery, the PMO produces a 6-month plan with specific activities anticipated to be worked on over the coming 6 months.

The August 2023 PMO 6-month plan focuses on two key issues: reduction in "time to deliver" and project risk mitigation. This is achieved largely through a baseline setting of governance, project delivery practice and delivery procedures to be distributed throughout the organization with mandatory basic training for all staff participating in the project delivery process. Risk management and mitigation will include reviewing lessons-learned, sources of change orders and improving the speed of issue resolution and executive decision making. It will also be a key objective to close out all final audit recommendations from the San Francisco Controller's Office review of project delivery in 2021.

Vehicles: Open Grants & Project Delivery

Under Prop K, the Muni vehicles program was the largest in the Expenditure Plan, mirroring the criticality of new and well-maintained transit vehicles to providing safe and reliable transit service. About 73% of the remaining balance for Prop K grants for Muni vehicles is for the SFMTA's Light Rail Vehicle 4 (LRV4) Program. The LRV4 Program is a large, lengthy, and complex project to replace the entire fleet of 151 Breda LRVs that was placed into revenue service in 1999. The LRV4 project has a cost of over $1.1 billion and is funded by many different federal, state, regional, and local funding sources, with the sales tax serving as a key local match source. Over the past several years, Prop K expenditures were slower than expected due to delays in the program. Some of the initial delays were associated with performance issues of the new cars and more recently, delays were due to COVID-19 impacts to production and subsequent and ongoing supply chain issues.

Siemens, the manufacturer for LRV4 railcars, has recovered from COVID-19 delays and is delivering vehicles on schedule. Prop K funded 24 LRV4 expansion vehicles and 151 replacement vehicles. All 24 expansion vehicles are in revenue service, and as of

September 2023, 48 replacement vehicles were in revenue service while an additional 10 are being evaluated on-site.

Many of the bus procurements are progressing to project closeout. All vehicles are in service for three of the open motor and trolley coach procurement grants (67 40-foot and 50 60-foot Low Floor Hybrid Diesel Motor Coaches, Replace 33 60-ft Trolley Coaches, Replace 100 40-foot Trolley Coaches) and the grants that are still open are for the warranty work. Seventeen of the hybrid motor coaches from the Replace 30 30-foot Hybrid Motor Coaches grant are in revenue service. Appendix C ~~The Muni Maintenance 5YPP comprehensive amendment~~ includes a chart of all Muni vehicles planned, ordered, and placed in revenue service with Prop K and Prop L funds as of December 2024.

In most cases, the vehicles that will be purchased with Prop L funds will replace vehicles that were purchased with Prop K local match funds. When the old vehicles are sold, a share of the proceeds from the sale of the vehicle, proportional to the Prop K share of the funding plan, will be returned to the Transportation Authority and reprogrammed in accordance with Prop L Strategic Plan policies.

Facilities: Open Grants & Project Delivery

SFMTA has successfully delivered a number of transit facilities projects in the past 10 years, including: 1570-1580 Burke Ave. for Overhead Lines and Materials Management; 1301 Cesar Chavez for hybrid buses; built, leased and/or maintained 166 Operator restrooms in SF and Daly City; HVAC improvements at a number of operation and maintenance facilities; rebuilt escalators at 7 Muni Metro Stations; and installed the first 12 Battery Electric Bus (BEB) chargers at Woods Yard in the Phase I BEB pilot program.

SFMTA continues to face funding challenges for rebuilding facilities. Demand is so high for federal transit formula funds in the San Francisco-Oakland urbanized area, that facilities projects rarely score high enough to receive these funds through the Metropolitan Transportation Commission and SFMTA has to look for other local sources or compete for discretionary funds. The 2022 SFMTA Bond proposal, which would have funded the Potrero Modernization and other facilities projects, failed by 1.5%. SFMTA is seeking to place a measure on the San Francisco ballot again in 2026 to secure much needed local funds to leverage other funds for facilities and other projects. Meanwhile, the SFMTA is applying for funding from Prop L, Regional Measure 3, and other local, regional, state, and federal sources to advance important projects to support facility and fleet electrification.

In recognition of the scale and impact of the Presidio and Potrero modernization projects, as well as the use of a public-private-partnership (P3) project delivery

method which SFMTA has not used before, SFCTA staff are performing an enhanced level of oversight on these projects.

Guideway Projects: Open Grants & Project Delivery

SFMTA's track replacement and upgrade projects had experienced delays due to challenges with staffing resources and revised priorities based on field surveys of SFMTA's trackwork. This required project designers to focus on other tasks while the project scope was reviewed and revised based on current needs and field conditions. Most project locations are repairs to existing track, which have been designed through in-house labor and are under construction either through in-house staff or through contractors.

Fiscal Year 2023/24 Facility & Fleet Electrification Projects

The SFMTA's Building Progress Program outlines the strategy for modernization, electrification, and joint development for SFMTA's 30 major facilities, 12 Muni Metro and Central Subway Stations, and 166 operator restrooms. As part of this program, the SFMTA is revising its 2017 Facilities Framework in 2023 to include changes required by the California Air Resources Board (CARB) to electrify SFMTA's bus fleet by 2040.

The Potrero Modernization Project is the first of six bus yards that will be rebuilt for 213 Electric Trolley Buses (ETBs), with joint development of affordable housing adjacent to and if feasible affordable and workforce housing above the bus facility, and commercial uses on the street levels. The Potrero development is SFMTA's first public private partnership (P3) to design, finance, build and maintain the bus facility for 30 years. The SFMTA is requesting Prop L, RM3 and other funding in Fiscal Year 2023/24 to complete the final design, environmental document, entitlements, Project Agreement, and construction through a P3 design build contract.

Battery Electric Bus (BEB) pilot projects are advancing in Fiscal Year 2023/24 with Prop L funds and a FTA Bus Facilities grant funding for Woods Yard Phase 2 (12 BEB chargers) and Islais Creek Yard (6 chargers). The Prop L funds for the Woods and Islais Creek Yard Electrification Phase I project will support the installation of these 18 BEB chargers. The 18 chargers will be used to charge the buses that will be procured using Prop L funds, through the 60' and 40' Battery Electric Bus Procurement Replacing Motor Coaches (18 Vehicles) project.

Please see Appendix B for the SFMTA Building Progress Program and Fleet Program Update presentation for the status of electrifying their fleet and facilities, as of Fall 2023.

6. Project Prioritization

The intent of establishing and documenting a methodology to select proposed projects is to provide the Transportation Authority Board, the public, and project sponsors with a clear understanding of how projects are prioritized for funding within each Prop L program. Working in consultation with project sponsors and drawing upon the Transportation Authority's experience with prioritizing projects for grant funding, Transportation Authority staff developed a set of Prop L program-wide criteria to help select projects in each of the 28 Prop L programs. In addition, most programs also have program-specific criteria to inform priorities such as improving transit reliability and travel time or replacing assets at the end of their useful lives. The Prop L program-wide criteria include:

- Project readiness
- Relative level of need or urgency
- Benefit to disadvantaged populations
- Level and diversity of community support
- Leveraging

The above criteria, along with any program-specific criteria, are scored for each proposed project. In addition, the evaluation process also considers a fair geographic distribution and cost-effectiveness.

San Francisco's Equity Priority Communities are an important factor in assessing projects and benefits to disadvantaged populations. See the map on the Transportation Authority's website: https://epc-map.sfcta.org/

The Project Scoring Table in Section 7 shows the Prop L program-wide criteria, the program-specific criteria, criteria definitions, and maximum possible points for projects proposed for the Muni Maintenance, Rehabilitation, and Replacement 5YPP. For each proposed project, the project sponsors first scored the project and then Transportation Authority staff reviewed and refined the scoring, as needed, to ensure consistent application of the prioritization criteria.

7. Project List

This section shows how each project proposed for funding from the Muni Maintenance, Rehabilitation, and Replacement program ranked based on the prioritization methodology described in Section 6; the 5-Year Program of Projects or Project List recommended for Prop L funds; and Anticipated Leveraging. The Project Information Forms with details on scope, schedule, cost, funding are included in Appendix A.

We recommend that the Board approve the Muni Maintenance 5YPP in two parts. Part one includes programming for only Fiscal Year 2023/24 for projects with time sensitive funding needs and requiring Prop L allocations this fiscal year. This 5YPP includes placeholder funds for projects in the remaining four years (Fiscal Years 2024/25 through 2027/28) to provide more time to refine project priorities and strengthen funding plans. Transportation Authority staff plan to recommend programming the placeholders to specific projects through a comprehensive Muni Maintenance 5YPP amendment (part two of 5YPP approval) anticipated in fall 2024. This approach was developed in consultation with SFMTA staff who are supportive of the proposed approach.

The Strategic Plan Baseline approved in June 2023 advanced funds for the Muni Maintenance program beyond the pay-as-you-go amounts in anticipation of the need to advance funds to accommodate the programming requests for various fleet, facility, and guideway projects. The baseline includes $129 million in the first five years (advanced from $74.2 million through a Strategic Plan amendment approved by the Board in June 2023). The Muni Maintenance program is more than double the size of any other program, therefore we advanced funds in the baseline to get a more realistic picture of financing costs for Prop L as a whole. We are aware of the need for significant investments in facilities state of good repair, as well as the need to meet the regulatory requirements around electrification and to build the necessary charging infrastructure before electric vehicles arrive on site. Additionally, we are aware that the SFMTA's bus fleet will require mid-life overhauls in the near term and replacements as the vehicles approach the end of their useful life.

For this 5YPP, we recommend advancing $17.8 million in Prop L out-year programming, the equivalent programming amount involved in The Portal/New Flyer Mid-Life Overhaul fund exchange, so that SFMTA can use all the programming capacity available in this 5-year period consistent with the Strategic Plan Baseline, as amended. This results in $146.8 million available for programming in this 5-year period and doesn't increase cash flow (nor financing costs) since The Portal doesn't need cash flow capacity until FYs 2030/31 and 2031/32. Programming in the 5-year period is heavily front-loaded (over 65% in FY 2023/24) to make funds available for allocation to several priority fleet and facility projects shown in the project list below.

One of the advantages of having a local sales tax for transportation is the flexibility to advance projects by participating in fund exchanges with other fund sources when necessary. This 5YPP includes two dollar-for-dollar fund exchanges between Prop L and Regional Transportation Improvement (RTIP) funds that have strict timely use of funds requirements and other requirements that limit the types of projects that are a good fit for this grant program. In each of the proposed fund exchanges, the SFMTA is held harmless (i.e., for The Portal RTIP Fund Exchange with Mid-Life Overhauls) or benefits from the exchange (i.e., for the Housing Incentive Pool (HIP) Grant Program Placeholder / RTIP Fund Exchange with Mid-Life Overhauls).

5YPP Amendment: This 5YPP amendment programs placeholder funds to specific projects in Fiscal Years 2024/25 through 2027/28, and it updates the programming and cash flows for three existing projects with Prop L funds previously programmed in December 2023.

Updates to the three existing projects include:

- Housing Incentive Pool (HIP) Grant Program Placeholder: We delayed the year of programming from Fiscal Year 2024/25 to FY 2025/26 to better align with the funding needs for the HIP projects.
- Woods/Islais Creek Yard Electrification Phase I project: We revised the Prop L amount to reflect the actual amount of Prop L funds allocated in 2024 ($2,358,000)($750,000 less than originally programmed).
- Muni Metro Stations Condition Assessment (Embarcadero to West Portal) project: We updated the Project Information Form to reflect the revised schedule, cost, and funding plan and increased the Prop L programming request to cover a $750,000 increase in the estimated project cost (from $750,000 to $1,500,000).

These changes are included in the revised 5-Year Program of Projects (Project List), shown below.

The revised 5-year project list also reflects a modest advancing of Prop L funds programmed from Fiscal Year 2027/28 to FY 2026/27 and slower annual cash flows (i.e, reimbursement schedule) for the specific projects compared to the placeholders in the approved Muni Maintenance 5YPP and the Strategic Plan Baseline, as amended. The net effect of this would be a minor reduction in financing costs compared to the Strategic Plan Baseline, as amended.

Prop L Project Submissions Evaluation - EP 06 Muni Maintenance

		Prop L-Wide Criteria					Program Specific Criteria			
District	**Projects**	**Project Readiness**	**Relative Level of Need or Urgency (time sensitive)**	**Benefits to Disadvantaged Populations**	**Level and Diversity of Community Support**	**Leveraging**	**Safety**	**Need (Asset Useful Life)**	**Improves Efficiency of Transit Operations**	**Total**
Vehicles (sub-program)										
Citywide	**32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)***	4	0	5	0	2	2	4	4	21
Citywide	40' Hybrid Motor Coach Replacement (94 Vehicles)	4	0	5	0	2	0	4	4	19
Citywide	60' and 40' Battery Electric Bus Procurement Replacing Hybrid Motor Coaches (18 Vehicles)	4	4	5	0	2	0	4	4	23
Citywide	**Cable Car Restoration Placeholder***	This is a placeholder. Projects will be scored at time of programming.								0
TBD	Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls)	This is a placeholder. Projects will be scored at time of programming.								0
Citywide	**LRV4 Quarterlife Overhauls Phase I (99 Vehicles)***	5	0	5	0	2	2	4	4	22
Citywide	**New Flyer Midlife Overhauls Phase II***	4	4	5	0	4	2	4	4	27
Citywide	**New Jersey PCC Streetcar Midlife Overhauls (16 Vehicles)***	4	0	5	0	4	2	4	4	23
Citywide	**Paratransit Vehicle Replacement (72 Vehicles)***	4	0	5	0	3	2	4	4	22
District 6	The Portal (RTIP Fund Exchange with Mid-Life Overhauls)	This project will be scored as part of the EP 05 Caltrain Downtown Rail Extension and Pennsylvania Alignment 5YPP.								0
	Total Possible Score	5	4	5	5	4	4	4	4	35

Prop L Project Submissions Evaluation - EP 06 Muni Maintenance

District	Projects	Project Readiness	Relative Level of Need or Urgency (time sensitive)	Benefits to Disadvantaged Populations	Level and Diversity of Community Support	Leveraging	Safety	Need (Asset Useful Life)	Improves Efficiency of Transit Operations	Total
Facilities and Guideways (sub-program)										
Citywide, District 3	**Cable Car Barn Rehabilitation***	3	0	5	2	2	2	4	4	22
Citywide, District 3	**Kirkland Yard Electrification***	4	4	5	2	2	2	3	2	24
Citywide	Muni Metro Subway Stations Condition Assessment (Embarcadero to West Portal)	3	0	5	0	0	2	2	2	14
Citywide, District 9	Potrero Yard Modernization	5	4	5	3	4	4	4	4	33
Citywide, District 2	Presidio Yard Modernization	3	4	5	5	4	4	4	4	33
Citywide	Woods/Islais Creek Yard Electrification Phase I	5	4	5	2	4	2	4	2	28
	Total Possible Score	5	4	5	5	4	4	4	4	35

***New project** in the proposed Muni Maintenance, Rehabilitation, and Replacement 5YPP Amendment

	Project Scoring Key: Projects are assessed using Transportation Authority Board adopted Prop L-wide criteria and program specific prioritization criteria. In general, the better a project meets the criteria as defined, the more points the project is assigned.
	Project Readiness: Highest possible score is 5. Project is likely to need funding in the fiscal year proposed. Factors to be considered include, but are not limited to adequacy of scope, schedule, budget and funding plan relative to current project status (e.g. expect more detail and certainty for a project about to enter construction than design); whether prior project phases are completed or expected to be completed before beginning the next phase; and whether litigation, community opposition or other factors pose a significant risk to project advancement, as proposed.
	Relative Level of Need or Urgency (time sensitive): Highest possible score is 4. Project needs to proceed in the proposed timeframe to enable construction coordination with another project (e.g. minimize costs and construction impacts), to support another funded or proposed project (e.g. signal conduit installation coordination with a street resurfacing project) or to meet timely use of funds deadlines associated with matching funds.
	Benefits to Disadvantaged Populations: Highest possible score is 5. Project provides direct benefits to disadvantaged populations, including communities historically harmed by displacement, transportation policies, and projects that utilized eminent domain. Project directly impacts the ability of disadvantaged populations to access transportation (e.g. new or enhanced infrastructure, new service or improved service, improved safety, etc.), whether or not the project is directly located in an Equity Priority Community. Points are based on the description of benefits presented in the Project Information Form.

	Level and Diversity of Community Support: Highest possible score is 5. Project has clear and diverse community support, including from disadvantaged populations and/or was developed out of a community-based planning process. Five points for a project that 1) is in an adopted community based plan or with evidence of diverse (neighborhood level and citywide) community support and 2) has documented support from disadvantaged populations. Three points for a project not in an adopted community based plan, but with evidence of support from *both* neighborhood stakeholders and citywide groups. Project does not have documented support from disadvantaged populations. One point for a project not in an adopted community based plan, but with evidence of support from *either* neighborhood stakeholders or citywide groups. Project does not have documented support from disadvantaged populations. Zero points for a project that was neither developed out of a community-based planning process nor has other forms of demonstrated community support.
	Leveraging: Highest possible score is 4. Project demonstrates actual or potential leveraging of Prop L funds, as indicated in the funding plan. Factors to consider include the status of other fund sources and the likely competitiveness for securing non-Prop L funds from discretionary sources.
	Safety: Highest possible score is 4. Project improves safety for passengers, operators and/or employees. Projects that address a documented safety issue should score more highly. Points are based on the safety information presented in the Project Information Form.
	Vehicles - Need (Asset Useful Life): Highest possible score is 4. Project replaces asset at end of useful life or for transit vehicles addresses best practices for mid-life overhauls so that assets operate safely and reliably through the end of their useful life.
	Vehicles - Improves Efficiency of Transit Operations: Highest possible score is 4. Project supports reliable transportation services and improved efficiency.
	Facilities and Guideways - Need (Asset Useful Life): Highest possible score is 4. Project replaces asset at end of useful life.
	Facilities and Guideways - Improves Efficiency of Transit Operations: Highest possible score is 4. Project supports reliable transportation services and improved efficiency.

2023 Prop L 5-Year Project List (FY 2023/24 - FY 2027/28)
06- Muni Maintenance, Rehabilitation, and Replacement
Programming Year
Pending March 2025 Board Meeting

Agency	Project Name	Status	Phase	Fiscal Year of Allocation					Total
				2023/24	2024/25	2025/26	2026/27	2027/28	
Sub-Program: Vehicles									
SFMTA	**32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)***	Planned	Construction					$4,550,000	$4,550,000
SFMTA	40' Hybrid Motor Coach Replacement (94 Vehicles)	Allocated	Construction	$32,300,000					$32,300,000
SFMTA	60' and 40' Battery Electric Bus Procurement Replacing Hybrid Motor Coaches (18 Vehicles)	Allocated	Construction	$10,000,000					$10,000,000
SFMTA	**Cable Car Restoration Placeholder***	Planned	Construction		$900,000				$900,000
SFMTA	Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls) [1]	Programmed	TBD			$18,270,000			$18,270,000
SFMTA	**LRV4 Quarterlife Overhauls Phase I (99 Vehicles)***	Planned	Construction				$13,900,000		$13,900,000
SFMTA	**New Flyer Midlife Overhauls Phase II***	Planned	Construction			$12,640,000			$12,640,000
SFMTA	**New Jersey PCC Streetcar Midlife Overhauls (16 Vehicles)***	Planned	Construction				$947,000		$947,000
SFMTA	**Paratransit Vehicle Replacement (72 Vehicles)***	Planned	Planning/ Conceptual Engineering					$2,993,000	$2,993,000
TJPA	The Portal (RTIP Fund Exchange with Mid-Life Overhauls) [2]	Programmed	Construction					$17,847,000	$17,847,000
Sub-Program: Facilities & Guideways									
SFMTA	**Cable Car Barn Rehabilitation***	Planned	Environmental Studies (PAED)			$2,000,000			$2,000,000
SFMTA	**Cable Car Barn Rehabilitation***	Planned	Planning/ Conceptual Engineering				$3,496,000		$3,496,000
SFMTA	**Kirkland Yard Electrification***	Planned	Design Engineering (PS&E)		$5,496,000				$5,496,000
SFMTA	Muni Metro Stations Condition Assessment (Embarcadero to West Portal)	Programmed	Planning/ Conceptual Engineering	$750,000					$750,000
SFMTA	**Muni Metro Stations Condition Assessment (Embarcadero to West Portal)***	Planned	Planning/ Conceptual Engineering		$750,000				$750,000
SFMTA	Potrero Yard Modernization	Allocated	Design Engineering (PS&E)	$12,500,000					$12,500,000
SFMTA	Presidio Yard Modernization	Allocated	Planning/ Conceptual Engineering	$5,150,000					$5,150,000
SFMTA	Woods/Islais Creek Yard Electrification Phase I [3]	Allocated	Design Engineering (PS&E)	$2,358,000					$2,358,000
Vehicles, Facilities, and Guideways Placeholder									
SFMTA	Muni Maintenance FY25-28 Placeholder [4]				$0	$0	$0	$0	$0
	Proposed Programming for 5YPP Amendment			63058000	$7,146,000	$32,910,000	$18,343,000	$25,390,000	$146,847,000
	Funds Programmed in 2023 Strategic Plan Baseline As Amended			$63,808,000	$32,800,000	$14,180,000	$1,177,000	$34,882,000	$146,847,000
	Cumulative Remaining Programming Capacity			$750,000	$26,404,000	$7,674,000	($9,492,000)	$0	$0

***New project** in the proposed Muni Maintenance, Rehabilitation, and Replacement 5YPP Amendment

[1] Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls): Placeholder for one or more SFMTA projects that are eligible to receive HIP grant program funding. In December 2023, MTC approved a swap that programmed $18.27 million in MTC RTIP funds reserved for the HIP program to the SFMTA's New Flyer Mid-Life Overhauls Phase III project in exchange for a like amount of Prop L funds for a HIP-eligible SFMTA project or projects. The benefits of this fund exchange include: earlier availability of the HIP funds than if they were in the RTIP (FY31 for RTIP funds); ability for SFMTA to use flexible Prop L funds instead of RTIP funds, which are much more restrictive; and, the mid-life overhauls project becoming a top priority for RTIP programming in the region. The $18.27 million in MTC RTIP funds have been added to the $45.569 million in San Francisco RTIP funds that the SFCTA Board recommended programming to the bus overhauls. Amended 5YPP delays the fiscal year of allocation from FY2024/25 to FY2025/26 to better align with HIP-eligible project schedules and funding needs.

[2] The Portal (RTIP Fund Exchange with Mid-Life Overhauls): Dollar-for-dollar fund exchange of RTIP funds and Prop L. The fund exchange enables the Transportation Authority to fulfill its RTIP commitment to The Portal, which can't receive the RTIP funds directly since the project's progressive design build approach doesn't easily comply with RTIP guidelines. In October 2023, the SFCTA Board recommended programming $45.569 million in RTIP funds to the SFMTA's New Flyer Mid-Life Overhauls Project Phase III that included $17.847 million in RTIP funds conditioned upon approval of the subject fund exchange, which was approved as part of the Muni Maintenance 5YPPadoption in December 2023.

[3] Woods/Islais Creek Yard Electrification Phase I: Revised to reflect the amount of Prop L funds allocated in 2024 ($750,000 less than originally programmed).

4 Muni Maintenance FY25-28 Placeholder: Reduced from $14,530,000 to $0 in FY25, $14,180,000 to $0 in FY26, $1,177,000 to $0 in FY27, and $17,035,000 to $0 in FY28.

2023 Prop L 5-Year Project List (FY 2023/24 - FY 2027/28)
06- Muni Maintenance, Rehabilitation, and Replacement
Cash Flow (Maximum Annual Reimbursement)
Pending March 2025 Board Meeting

Project Name	Phase	Fiscal Year of Reimbursement									Total
		2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	
Sub-Program: Vehicles											
32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)*	Construction						$3,499,000	$1,051,000			$4,550,000
40' Hybrid Motor Coach Replacement (94 Vehicles)	Construction			$20,000,000	$10,500,000	$1,800,000					$32,300,000
60' and 40' Battery Electric Bus Procurement Replacing Hybrid Motor Coaches (18 Vehicles)	Construction			$4,000,000	$5,000,000	$1,000,000					$10,000,000
Cable Car Restoration Placeholder*	Construction			$450,000	$450,000						$900,000
Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls) [1]	TBD			$6,090,000	$6,090,000	$6,090,000					$18,270,000
LRV4 Quarterlife Overhauls Phase I (99 Vehicles)*	Construction				$6,855,000	$3,522,000	$3,523,000				$13,900,000
New Flyer Midlife Overhauls Phase II*	Construction			$3,000,000	$5,000,000	$4,640,000					$12,640,000
New Jersey PCC Streetcar Midlife Overhauls (16 Vehicles)*	Construction					$500,000	$447,000				$947,000
Paratransit Vehicle Replacement (72 Vehicles)*	Planning/ Conceptual Engineering						$2,000,000	$993,000			$2,993,000
The Portal (RTIP Fund Exchange with Mid-Life Overhauls) [2]	Construction								$8,924,000	$8,923,000	$17,847,000
Sub-Program: Facilities & Guideways											
Cable Car Barn Rehabilitation*	Environmental Studies (PAED)			$400,000	$800,000	$800,000					$2,000,000
Cable Car Barn Rehabilitation*	Planning/ Conceptual Engineering				$1,496,000	$2,000,000					$3,496,000
Kirkland Yard Electrification*	Design Engineering (PS&E)			$2,748,000	$2,748,000						$5,496,000
Muni Metro Stations Condition Assessment (Embarcadero to West Portal)	Planning/ Conceptual Engineering		$300,000	$300,000	$150,000						$750,000
Muni Metro Stations Condition Assessment (Embarcadero to West Portal)*	Planning/ Conceptual Engineering		$200,000	$400,000	$150,000						$750,000
Potrero Yard Modernization	Design Engineering (PS&E)		$2,500,000	$1,850,000	$4,075,000	$4,075,000					$12,500,000
Presidio Yard Modernization	Planning/ Conceptual Engineering		$450,000	$1,700,000	$3,000,000						$5,150,000
Woods/Islais Creek Yard Electrification Phase I	Design Engineering (PS&E)		$1,179,000	$1,179,000							$2,358,000
Vehicles, Facilities, and Guideways Placeholder											
Muni Maintenance FY25-28 Placeholder [4]			$0	$0	$0	$0					$0
Cash Flow Proposed for 5YPP Amendment		$0	$4,629,000	$42,117,000	$46,314,000	$24,427,000	$9,469,000	$2,044,000	$8,924,000	$8,923,000	$146,847,000
Cash Flow in 2023 Strategic Plan Baseline As Amended		$0	$19,380,000	$49,620,000	$30,000,000	$30,000,000	$0	$0	$8,924,000	$8,923,000	$146,847,000
Cumulative Remaining Cash Flow Capacity		$0	$14,751,000	$22,254,000	$5,940,000	$11,513,000	$2,044,000	$0	$0	$0	$0

Anticipated Leveraging

The table below compares Prop L Expenditure Plan assumptions with anticipated leveraging for the recommended projects based on the Project Information Forms. At time of allocation, Transportation Authority staff will reevaluate the actual leveraging to the expected leveraging.

Table 2. Prop L Leveraging: Expected vs. Proposed ~~for Fiscal Year 2023/24~~

PROJECT	EXPECTED LEVERAGING IN EP (NON-PROP L FUNDS)	ANTICIPATED LEVERAGING (NON-PROP L FUNDS)
32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)*	90.1%	71%
40' Hybrid Motor Coach Replacement (94 Vehicles)	90.1%	78%
60' and 40' Battery Electric Bus Procurement Replacing Motor Coaches (18 Vehicles)	90.1%	77%
Cable Car Restoration Placeholder*	90.1%	TBD
LRV Quarterlife Overhauls Phase I (99 Vehicles)*	90.1%	62%
New Flyer Midlife Overhauls Phase II*	90.1%	90%
New Jersey PCC Streetcar Midlife Overhauls (16 Vehicles)*	90.1%	97%
Paratransit Vehicle Replacement (72 Vehicles)*	90.1%	80%
Cable Car Barn Rehabilitation*	90.1%	78%
Kirkland Yard Electrification*	90.1%	96%
Muni Metro Stations Condition Assessment (Embarcadero to West Portal)	90.1%	0%
Potrero Yard Modernization	90.1%	96%
Presidio Yard Modernization	90.1%	99%
Woods/Islais Creek Yard Electrification Phase I**	90.1%	94%
Muni Maintenance Program Total	**90.1%**	**93%**

~~*For projects with funds programmed in FY 23/24 only.~~

*New project

**Updated leveraging to reflect lower Prop L amount

~~We will evaluate the anticipated leveraging for the full Muni Maintenance program again when we amend this 5YPP (anticipated in Fall 2024) to program the placeholder funds in Fiscal Years 2024/25-2027/28. We will reevaluate leveraging for each project at the time of allocation request.~~

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Perform scheduled maintenance on the 30 vehicles in the 32' hybrid motor coach fleet in accordance with manufacturer recommendations. Maintenance data shows that rehabilitation of the fleet significantly improve vehicle reliability, helps reduce incidents of breakdowns, and prevent service interruptions and additional and costly repairs. The scope of work will remain like-to-like replacement and will not upgrade vehicles to the latest vehicle configuration.		
Project Location and Limits:	Citywide		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?	-		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Perform scheduled maintenance on the 32' hybrid motor coach fleet in accordance with manufacturer recommendations. Maintenance data shows that rehabilitation of the fleet significantly improve vehicle reliability, helps reduce incidents of breakdowns, and prevent service interruptions and additional and costly repairs. This overhaul program will address the 30 32' El Dorado hybrid coaches that were accepted and put into revenue service between 2022-2024. FTA states that the useful life of these small heavy-duty 30' transit buses is 10 years/350,000 miles. The overhaul program will focus on reducing the incidents of in-service breakdowns and service interruptions, which are critical to maintaining the reliability of the fleet. Maintenance data from similar projects indicates that these mid-life overhauls significantly enhance the vehicles' performance, ensuring they operate safely and reliably through the end of their useful life. The project will not upgrade the vehicles to the latest model configurations but will focus on like-for-like replacements to maximize efficiency and cost-effectiveness. An example of latest vehicle configuration includes overhaul, hybrid propulsion system, engine, pneumatic systems, operator console area, HVAC system, and other hydraulic systems. Through this overhaul, the SFMTA aims to improve service reliability, reduce repair costs, and ensure a comfortable and safe experience for both passengers and operators. The project also supports the agency's broader goals of maintaining high operational standards while adhering to best practices for asset management and fleet maintenance.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	N/A		
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	N/A		

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	0%		Q1-Jul-Aug-Sep	2027/28	Q2-Oct-Nov-Dec	2027/28
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	0%		Q1-Jul-Aug-Sep	2027/28	Q1-Jul-Aug-Sep	2028/29
Advertise Construction	0%	Contracted	Q2-Oct-Nov-Dec	2027/28		
Start Construction (e.g. Award Contract)	0%	Contracted	Q1-Jul-Aug-Sep	2028/29		
Operations (i.e. paratransit)						
Open for Use					Q3-Jan-Feb-Mar	2029/30
Project Completion (means last eligible expenditure)					Q4-Apr-May-Jun	2030/31

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -			
Environmental Studies (PA&ED)	$ -			
Right of Way	$ -			
Design Engineering (PS&E)	$ -			
Construction	$ 15,666,384	$ 4,550,000	$11,116,384	Prior Overhaul Phase I Work
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 15,666,384	$ 4,550,000	$ 11,116,384	
Percent of Total		**29%**	**71%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2027/28	$ 4,550,000	$ -	$ -	$ -	$ -	$ -	$3,499,000	$1,051,000
Transit Capital Priorities		Construction	Planned	2027/28	$ 10,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TBD (e.g.,Revenue Bond, TSF, Prop B)		Construction	Planned	2029/30	$ 1,116,384	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 15,666,384**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 3,499,000**	**$ 1,051,000**

Notes

SFMTA will need to show a fullly funded construction phase when submitting the future allocation request for Prop L construction funds.

Prop L Supplemental Information **Please fill out each question listed below (rows 2-8) for all projects.**	
Project Name	***32' Motor Coach El Dorado Midlife Overhauls (30 Vehicles)***
Relative Level of Need or Urgency (time sensitive)	This overhaul program will address the 30 32' El Dorado coaches. It is important that the project proceed as described in the schedule because maintenance data shows that rehabilitation of the fleet significantly improves vehicle reliability, helps reduce incidents of breakdowns, and prevent service interruptions and additional and costly repairs.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	With the state of good repairs, the coaches are more reliable and coach availabilities have improved. Indeed, the SFMTA released the full list of findings from its 2023 rider satisfaction survey recently. Agency officials revealed in June that 72% of the surveyed respondents rated Muni service as "excellent" or "good." The share was the agency's highest customer satisfaction rating since the SFMTA first began conducting the annual surveys in 2001.
Benefits to Disadvantaged Populations and Equity Priority Communities	Disadvantaged populations and Equity Priority Communities often rely more heavily on public transit as their primary transportation mode. While 20% of San Francisco residents are low income, 38% of Muni riders are low income, and 70% of Muni riders are people of color, compared to 63% of city residents. These midlife overhauls will help provide safe and reliable transit service to all areas in San Francisco, including all Equity Priority Communities.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Economic Vitality, Safety and Livability
	Ensure quality of life and economic health in San Francisco. The primary objective of the transportation system must be the safe and efficient movement of people and goods. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobiles. Within San Francisco, travel by Public transit, by bicycle and on foot must be an attractive alternative to travel by private automobile.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The 32' Motor Coach El Dorado Midlife Overhaul project improves safety by conducting comprehensive maintenance on key vehicle systems, including braking, propulsion, and pneumatic systems. These overhauls are essential to ensuring that the buses operate reliably and safely, reducing the risk of mechanical failures while in service. The refurbishment of safety systems and the interior layout also enhances safety for both passengers and operators by improving emergency exits, reinforcing stanchions, and updating surveillance systems. Maintenance data indicates that fleet rehabilitation decreases incidents of in-service breakdowns, which can present significant safety hazards, particularly when transporting vulnerable populations.
Need (Asset Useful Life) (Vehicles Sub-program)	This project focuses on performing mid-life overhauls on the 32' El Dorado motor coach fleet in accordance with manufacturer guidelines and best practices for transit vehicle maintenance. The rehabilitation process is designed to address issues that arise as the vehicles approach mid-life, extending their service life and ensuring they continue to operate safely and reliably until their eventual replacement. Key systems such as propulsion and braking are overhauled, addressing wear and tear that, if left unchecked, could compromise vehicle safety and performance in the latter half of their useful life.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	By overhauling the 32' El Dorado motor coach fleet, the project directly improves transportation reliability by reducing the frequency of vehicle breakdowns and service interruptions. The mid-life maintenance process ensures that key vehicle systems are in optimal condition, decreasing the likelihood of delays caused by mechanical issues. These efforts contribute to more consistent and dependable transit services, particularly for routes that rely on these vehicles. Additionally, the project enhances operational efficiency by reducing the costs associated with emergency repairs and extending the lifespan of the fleet, allowing the agency to maximize the value of its assets.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	40' Hybrid Motor Coach Replacement (94 Vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06a- Vehicles		
Other Prop L Programs (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	This project is to replace the 94 hybrid 40' vehicles that were procured in 2013 and have reached the end of their useful life. The original scope of work was to replace these 94 vehicles with zero emission vehicles but due to impacts from COVID, facility upgrade progress to support electric buses is delayed and the SFMTA has to purchase additional hybrid vehicles for this procurement. The intention of this procurement is to conditionally accept the vehicles in 2 years from start of procurement. This would help to lower the average age of the bus fleet, which increases service reliability.		
Project Location and Limits:	San Francisco		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	Yes	**Is the project located in an Equity Priority Community (EPC)?**	Yes
Which EPC(s) is the project located in?	Citywide		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	This project is to replace the 94 hybrid 40' vehicles that were procured in 2013 and have reached the end of their useful lives. The original scope of work was to replace these 94 vehicles with zero emission vehicles but due to impacts from COVID, facility upgrade progress is delayed and the SFMTA has to purchase additional hybrid vehicles. The intention of this procurement is to conditionally accept the vehicles in 2 years from start of procurement, which would help to lower the average age of the bus fleet. Vehicles will be procured through a Cooperative Agreement through a state contract. The estimated cost per vehicle, based on previous contracts, escalation, and inflation, is $1.15 million. Effective October 1, 2019, the Innovative Clean Transit regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size. The SFMTA submitted the Rollout Plan for the California Air Resources Board's reugulation, updated in July 2022, which outlined the procurement schedule for 40' and 60' battery electric buses.		

	The SFMTA will be using a State Cooperative Agreement, therefore no advertisement is needed. Using the State Cooperative Agreement reduces the Contract Administrative time tremendously instead of issuing Request For Proposal (RFP). The SFMTA RFP process would take anywhere from 18 - 24 months from the time of advertisement to the Contract Award. SFMTA expects that the MTA Board will approve this contract in January 2024. The Board of Supervisors will consider approving this contract in February/March 2024. The Transit industry was impacted heavily by the pandemic on materials supply chain, labor resources and the infrastructure funding availabilities. As SFMTA continues to face the challenges of upgrading the electrification network, the SFMTA needs to continue providing reliable transit service to the San Francisco riders.
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	SFMTA Update on Facilities and Fleet Programs (SFCTA Board 11.28.23) (link)
Type of Environmental Clearance Required:	Categorically Exempt
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	60%	In-house	Q1-Jul-Aug-Sep	2023/24	Q2-Oct-Nov-Dec	2023/24
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	40%	In-house	Q1-Jul-Aug-Sep	2023/24	Q4-Apr-May-Jun	2023/24
Advertise Construction						
Start Construction (e.g. Award Contract)	0%	Contracted	Q1-Jul-Aug-Sep	2024/25		
Operations (i.e. paratransit)						
Open for Use	0%	Contracted			Q1-Jul-Aug-Sep	2026/27
Project Completion (means last eligible expenditure)		In-house			Q1-Jul-Aug-Sep	2028/29

Notes

Fleet capital projects have 4 phases: Planning, Contracting, Design & Procurement, and Warranty Close-Out.
*Planning covers what is for other projects two phases, Planning & Preliminary Engineering.
*Contracting covers what for other projects is Detail Design.
*Design & Procurement is what is called Construction in other projects.
*Warranty & Closeout covers what is Administrative Closure for other projects.

Mapping to the PIF:
*Planning/Conceptual Engineering = Planning
*Environmental Studies are not applicable
*Right of Way is not applicable
*Design Engineering (PS&E) = Contracting
*Advertise Construction is not a separate phase, it is encompassed within Design Engineering (Contracting)
*Start Construction (e.g. Award Contract) = start date for Design & Procurement for bus and rail
*Operations (i.e. paratransit) = start date Design & Procurement for paratransit
*Open for Use = end date for Start Construction and Operations (Design & Procurement) phases
*Project Completion (means last eligible expense) = Warranty & Closeout

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	40' Hybrid Motor Coach Replacement (94 Vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 461,000	$ -	$ 461,000	Prior procurement
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 1,730,000	$ -	$ 1,730,000	Prior procurement
Construction	$ 145,147,000	$ 32,300,000	$ 112,847,000	Prior procurement
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 147,338,000	$ 32,300,000	$ 115,038,000	
Percent of Total		**22%**	**78%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
General Fund Prop B		Planning/Conceptual Engineering	Programmed	2023/24	$ 31,000	$ -	$ -	$ -	$ -	$ -
General Fund Prop B		Planning/Conceptual Engineering	Programmed	2024/25	$ 242,000	$ -	$ -	$ -	$ -	$ -
RM3		Planning/Conceptual Engineering	Programmed	2023/24	$ 188,000	$ -	$ -	$ -	$ -	$ -
Dev Fee-Mission Rock		Design Engineering (PS&E)	Programmed	2024/25	$ 1,730,000	$ -	$ -	$ -	$ -	$ -
Dev Fee-Mission Rock		Construction	Programmed	2024/25	$ 1,571,000	$ -	$ -	$ -	$ -	$ -
RM3		Construction	Programmed	2023/24	$26,825,000	$ -	$ -	$ -	$ -	$ -
Transit Capital Priorities		Construction	Planned	2025/26	$ 73,451,000	$ -	$ -	$ -	$ -	$ -
Dev Fee-Pier 70		Construction	Programmed	2025/26	$ 5,500,000	$ -	$ -	$ -	$ -	$ -
Dev Fee-Pier 70		Construction	Programmed	2026/27	$ 5,500,000	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2023/24	$ 32,300,000	$ -	$ -	$ 20,000,000	$ 10,500,000	$ 1,800,000
				Total By Fiscal Year	**$ 147,338,000**	**$ -**	**$ -**	**$ 20,000,000**	**$ 10,500,000**	**$ 1,800,000**

Notes

MTC anticipates programming the FY 25/26 Transit Capital Priorities (e.g. federal transit formula funds) in Fall 2024. At that time, MTC is expected to update the bus price list which establishes the max amount of Transit Capital Priorities funds per vehicle that MTC will provide, leaving the sponsor to cover the required local match plus any costs that above that.

SFMTA submitted the RM3 allocation request to MTC in November 2023 for anticipated allocation in January 2024.

Developer based fees are less certain in the current economic climate. When the allocation request is submitted, SFMTA should provide examples of alternate sources in case the developer fees are not available when needed.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***40' Hybrid Motor Coach Replacement (94 Vehicles)***
Relative Level of Need or Urgency (time sensitive)	It is urgent that we replace the vehicles that were procured in 2013 as they have now reached the end of their useful lives. If these vehicles are not replaced in a timely manner, SFMTA will continue to run the vehicles after their useful lives and will not be able to take advantage of the lower emissions that the newest vehicle offer. In addition, in-service failures will cause service disruption, and unscheduled maintenance and labor costs will negatively impact SFMTA's operating budget.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	This project is not dedicated to a specific community. Fleet projects benefit the whole of the City, operating across the revenue service network. Community outreach is conducted as needed and can include presentations to stakeholder groups, public surveys and physical mock ups of aspects of the vehicles.
Benefits to Disadvantaged Populations and Equity Priority Communities	Disadvantaged Populations and Equity Priority Communities often rely on public transportation as their main transportation mode. The new vehicle replacement project provides safe and reliable bus services to all areas in San Francisco, including Disadvantaged Populations and Equity Priority Communities. Approximate Ridership Data (as of February 2020): ~36,000 youth ~63,000 seniors ~14,000 people with disabilities Source: https://www.sfmta.com/sites/default/files/reports-and-documents/2020/02/2-18-20_item_12_fare_policy_-_slide_presentation.pdf
Compatability with Land Use, Design Standards, and Planned Growth	
San Francisco Transportation Plan Alignment (SFTP)	Equity, Environmental Sustainability, Safety and Livability
	Equity; Safety and Livability: These vehicles provide safe, reliable, and equitable citywide transportation services by reducing the in-service failures of using the vehicles that past their useful life already. **Environmental Sustainability**: The newest vehicles offer lower emmisions than vehicles currently in use.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	Newer vehicles have higher emissions standards, so replacing in use vehicles when they reach the end of their useful lives improves air quality in service areas and for employees who service and operate the vehicles.
Need (Asset Useful Life) (Vehicles Sub-program)	This is a one-to-one replacement for vehicles at the end of their useful life.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	The newest vehicles will improve the reliability and availability for daily service and reduce the in-service failures of continuing use of the vehicles that are reached their useful lives.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	60' and 40' Battery Electric Bus Procurement Replacing Motor Coaches (18 Vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06a - Vehicles		
Second Prop L Program (if applicable):			
Other Prop L Programs (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Purchase 6 60' and 12 40' Battery Electric Buses, along with all required accessories, and deploy the vehicles in revenue service as replacements for 18 40' diesel electric hybrid buses. Replacing vehicles at the end of their useful life will keep the average fleet age down, which increases the reliability of service. Battery Electric Buses also generate zero greenhouse gas emissions because they are powered by a battery in their operating system rather than fuel and don't produce harmful exhaust.		
Project Location and Limits:	San Francisco		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	Yes	**Is the project located in an Equity Priority Community (EPC)?**	Yes
Which EPC(s) is the project located in?	Citywide		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Purchase 6 60' and 12 40' battery electric buses, along with all required accessories (Tools & Equipment, Spare Parts, Training and Data Monitoring subscription), and deploy the vehicles in revenue service as replacements for 18 40' diesel electric hybrid buses. The battery electric buses shall be procured from multiple manufacturers through various statewide procurement contracts (through Virginia or Washington state contracts), or possibly as options through existing procurement contracts. Vehicles are anticipated to be procured from two manufacturers: Gillig and New Flyer. The SFMTA would like to evaluate Gillig's ability to produce 40' battery electric buses, as these were not available during the time of the 40' battery bus pilot program. The other vehicles in the procurement will be provided by New Flyer, who has demonstrated the best overall performance in the battery bus pilot program. The 18 battery electric buses are replacing 18 motor coaches that were delivered to the SFMTA in 2013 and will have reached the end of their useful lives when they are replaced. The estimated cost per vehicle, based on the manufacturer's quotes is: - 40' battery electric bus: $1.42 million each - 60' battery electric bus: $2.17 million each		

	60' battery electric buses: $2.1 million each The 60' battery electric buses shall be stored and operated out of the Islais Creek bus facility, and the 40' battery electric buses shall be stored and operated out of the Woods bus facility. This procurement aligns with the SFMTA's Zero Emission Bus Rollout Plan. This procurement is an important step along the path to replacing diesel/hybrid buses with battery electric buses and achieving a complete zero-emissions fleet as highlighted in the Rollout Plan. An evaluation for suitability of battery electric buses for SFMTA will be conducted that will allow us to develop future procurement strategies for battery electric buses at scale. The SFMTA will be using a state cooperative agreement, therefore no advertisement is needed. SFMTA expects that the MTA Board will approve this contract in December 2023. The Board of Supervisors will consider approving this contract in February 2024. The project scope does not include the required charging infrastructure needed to accommodate the 18 battery electric buses. The charging infrastructure will be required to be installed prior to the arrival of these buses. Effective October 1, 2019, the Innovative Clean Transit regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size. The SFMTA submitted the Rollout Plan for the California
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	SFMTA Update on Facilities and Fleet Programs (SFCTA Board 11.28.23) (link)
Type of Environmental Clearance Required:	Categorically Exempt
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	50%	In-house and Contracted	Q3-Jan-Feb-Mar	2022/23	Q3-Jan-Feb-Mar	2023/24
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	0%	In-house and Contracted	Q3-Jan-Feb-Mar	2023/24	Q2-Oct-Nov-Dec	2024/25
Advertise Construction						
Start Construction (e.g. Award Contract)	0%	Contracted	Q3-Jan-Feb-Mar	2024/25		
Operations (i.e. paratransit)						
Open for Use					Q4-Apr-May-Jun	2025/26
Project Completion (means last eligible expenditure)		In-house			Q2-Oct-Nov-Dec	2030/31

Notes

Fleet capital projects have 4 phases: Planning, Contracting, Design & Procurement, and Warranty Close-Out.
*Planning covers what is for other projects two phases, Planning & Preliminary Engineering.
*Contracting covers what for other projects is Detail Design.
*Design & Procurement is what is called Construction in other projects.
*Warranty & Closeout covers what is Administrative Closure for other projects.

Mapping to the PIF:
*Planning/Conceptual Engineering = Planning
*Environmental Studies are not applicable
*Right of Way is not applicable
*Design Engineering (PS&E) = Contracting
*Advertise Construction is not a separate phase, it is encompassed within Design Engineering (Contracting)
*Start Construction (e.g. Award Contract) = start date for Design & Procurement for bus and rail
*Operations (i.e. paratransit) = start date Design & Procurement for paratransit
*Open for Use = end date for Start Construction and Operations (Design & Procurement) phases
*Project Completion (means last eligible expense) = Warranty & Closeout

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	60' and 40' Battery Electric Bus Procurement Replacing Motor Coaches (18 Vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 388,000	$ -	$ 388,000	Prior procurements
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 2,697,000	$ -	$ 2,697,000	Prior procurements
Construction	$ 41,031,000	$ 10,000,000	$ 31,031,000	Manufacturer's quote
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 44,116,000	$ 10,000,000	$ 34,116,000	
Percent of Total		**23%**	**77%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Transportation Sustainability Fee		Planning/Conceptual Engineering	Allocated	2021/22	$ 388,000	$ -	$ -	$ -	$ -	$ -
Low Carbon Fuel Sales		Design Engineering (PS&E)	Programmed	2022/23	$ 316,000	$ -	$ -	$ -	$ -	$ -
RM3		Design Engineering (PS&E)	Programmed	2023/24	$ 2,381,000	$ -	$ -	$ -	$ -	$ -
RM3		Construction	Programmed	2023/24	$ 12,374,000	$ -	$ -	$ -	$ -	$ -
Transit Capital Priorities		Construction	Planned	2025/26	$ 18,657,000	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2023/24	$ 10,000,000	$ -	$ -	$ 4,000,000	$ 5,000,000	$ 1,000,000
				Total By Fiscal Year	**$ 44,116,000**	**$ -**	**$ -**	**$ 4,000,000**	**$ 5,000,000**	**$ 1,000,000**

Notes

MTC anticipates programming the FY 25/26 Transit Capital Priorities (e.g. federal transit formula funds) in Fall 2024. At that time, MTC is expected to update the bus price list which established the max amount of Transit Capital Priorities funds per vehicle that MTC will provide, leaving the sponsor to cover the required local match plus any costs that above that. Costs for BEBs are considerably higher than hybrids, which will increase demands on the already oversubscribed Transit Capital Priorities funds, particular in the SFO/Oakland UZA (funding geography).

SFMTA submitted the RM3 allocation request to MTC in November 2023 for anticipated allocation in January 2024.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***60' and 40' Battery Electric Bus Procurement Replacing Motor Coaches (18 Vehicles)***
Relative Level of Need or Urgency (time sensitive)	The SFMTA must sign contracts with bus vendors by end-of-year 2023 to ensure buses are delivered in time to meet the SFMTA's procurement schedule. Keeping to the procurement schedule is imperative for maintaining service reliability and meeting California Air Resources Board Innovative Clean Transit mandate.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	This project is not dedicated to a specific community. Fleet projects benefit the whole of the City, operating across the revenue service network. Community outreach is conducted as needed and can include presentations to stakeholder groups, public surveys and physical mock ups of aspects of the vehicles. Procurement of battery buses is mandated by the SFMTA Zero Emission Policy and is outlined in the 2022 Zero Emission Rollout Plan.
Benefits to Disadvantaged Populations and Equity Priority Communities	Battery buses eliminate tailpipe emissions, increasing air quality in all areas of operation when compared to diesel buses. Bus replacements also serve to keep the average fleet age down, increasing reliability of public service for all of transit riders, including those in disadvantaged populations and Equity Priority Communities. Disadvantaged Populations and Equity Priority Communities often rely on public transportation as their main transportation mode. The new vehicle replacement project provides safe and reliable bus services to all areas in San Francisco, including Disadvantaged Populations and Equity Priority Communities. Approximate Ridership Data (as of February 2020): ~36,000 youth ~63,000 seniors ~14,000 people with disabilities Source: https://www.sfmta.com/sites/default/files/reports-and-documents/2020/02/2-18-20_item_12_fare_policy_-_slide_presentation.pdf
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Safety and Livability
	Environmental Sustainability: This project reduces emissions for the SFMTA's fleet by replacing diesel hybrid buses with battery electric buses, increasing environmental sustainability. Safety and Livability: Emissions reductions in public areas increases air quality, contributing to increased safety and livability within San Francisco.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	Battery electric buses have no tailpipe emissions, so replacing diesel hybrid buses when they reach the end of their useful lives improves air quality in service areas and for employees who service and operate the vehicles.
Need (Asset Useful Life) (Vehicles Sub-program)	The procured battery electric buses will replace existing diesel hybrid buses at the end of their useful lifespans at a 1:1 ratio. This reduces the average age of the fleet, increasing reliability, and reducing emissions of SFMTA's fleet.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	Battery electric buses are simpler than diesel hybrid buses, most notably in not utilizing an internal combustion engine. This simplicity should result in more reliability, and lower maintenance and operational costs compared to the SFMTA's existing diesel hybrid buses while increasing efficiency in keeping vehicles in service.

Project Name and Sponsor			
Project Name:	Cable Car Restoration Placeholder		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	This is a placeholder for the Cable Car Restoration Project. This project focuses on the restoration and refurbishment of San Francisco's historic cable car fleet. This includes full vehicle overhauls, bodywork, mechanical repairs, and paintwork to preserve the iconic appearance of the cars while ensuring their safe operation. The project is vital to maintaining the legacy and functionality of this unique transportation system, enhancing reliability and safety for passengers and operators, and ensuring these historic vehicles remain in operation for future generations.		
Project Location and Limits:	Citywide		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?	-		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	The Cable Car Restoration Project is a comprehensive program focused on the preservation, restoration, and maintenance of the historic cable car fleet operated by the SFMTA. This ongoing initiative involves multiple phases of refurbishment to ensure the fleet's reliability, safety, and historical integrity. With a total of 42 cable cars in operation, each restoration takes approximately 18 months to complete. The intricate work is performed by a team of highly skilled artisans, including carpenters, machinists, painters, mechanics, pattern makers, welders, and metalworkers, who bring their expertise to safeguard these iconic vehicles for future generations. Key components of the restoration include: - Full vehicle rehabilitations to address structural integrity and extend the service life of each cable car. - Carpentry and metalwork to restore and reinforce the car bodies. - Manufacturing new parts that align with the original specifications. - Restoration and repainting of cable cars in their original historic color schemes to preserve the visual heritage. - Mechanical overhauls of propulsion and braking systems, ensuring the vehicles operate safely and efficiently. - Preventative maintenance tasks performed outside of routine service cycles to avoid major disruptions and minimize future breakdowns. This project plays a crucial role in preserving the cultural and historical significance of San Francisco's cable car system while ensuring that it continues to function as a reliable and iconic part of the city's transit network. By prioritizing heritage conservation and operational safety, the project supports both the aesthetic value and functional utility of the cable cars for current and future generations.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	N/A		

Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	N/A

Project Delivery Milestones	**Status**	**Work**	**Start Date**		**End Date**	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering						
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)						
Advertise Construction						
Start Construction (e.g. Award Contract)	0%	In-house	Q3-Jan-Feb-Mar	2024/25		
Operations (i.e. paratransit)						
Open for Use					Q2-Oct-Nov-Dec	2028/29
Project Completion (means last eligible expenditure)					Q4-Apr-May-Jun	2028/29

Notes

This is a placeholder for cable car restorations to be performed during the 5YPP period.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Cable Car Restoration Placeholder

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ -	$ -	$ -	
Construction	$ 900,000	$ 900,000	$ -	Available funds, intended as local match
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 900,000	$ 900,000	$ -	
Percent of Total		**100%**	**0%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2024/25	$900,000	$ -	$ -	$ 450,000	$ 450,000	$ -
				Total By Fiscal Year	**$ 900,000**	**$ -**	**$ -**	**$ 450,000**	**$ 450,000**	**$ -**

Notes

This is a placeholder. When SFMTA is ready to request allocation of construction funds (expected April 2025) SFCTA will expect a fully funded phase or subphase, with appropriate leveraging.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Cable Car Restoration Placeholder***
Relative Level of Need or Urgency (time sensitive)	It is important that the project proceed as described in the schedule because maintenance data shows that rehabilitation of the fleet significantly improve vehicle reliability, helps reduce incidents of breakdowns, and prevent service interruptions and additional and costly repairs.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	With the state of good repairs, the coaches are more reliable and coach availabilities have improved. Indeed, the SFMTA released the full list of findings from its 2023 rider satisfaction survey recently. Agency officials revealed in June that 72% of the surveyed respondents rated Muni service as "excellent" or "good." The share was the agency's highest customer satisfaction rating since the SFMTA first began conducting the annual surveys in 2001.
Benefits to Disadvantaged Populations and Equity Priority Communities	N/A
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Safety and Livability
	Cable cars are an iconic symbol of SF and a major tourist attraction. Keeping them in good safe working order benefits SF's transportation network for residents and visitors.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The Cable Car Restoration Project enhances safety for passengers, operators, and employees by refurbishing critical systems, including the propulsion, braking, and structural components of the cars. These restorations address known safety risks associated with aging vehicles, including worn mechanical parts and outdated safety features.
Need (Asset Useful Life) (Vehicles Sub-program)	The Cable Car Restoration Project is crucial because the cable cars are not only functional transit vehicles but also a designated historic resource that must be preserved indefinitely. Unlike typical fleet assets that are replaced at the end of their useful life, these cable cars must be maintained and restored continuously to ensure their preservation for future generations. This project aligns with best practices for maintaining historic vehicles by conducting mid-life overhauls that address critical mechanical, structural, and cosmetic needs, allowing the cars to operate safely and reliably while honoring their historic integrity. Rather than replacing these irreplaceable assets, we are committed to sustaining and restoring them in perpetuity.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	By addressing key mechanical and structural issues, the Cable Car Restoration Project supports the reliable operation of San Francisco's iconic cable car system. Refurbishing propulsion, braking, and structural systems reduces the likelihood of in-service breakdowns, ensuring consistent and dependable service for passengers. The updated components also improve the operational efficiency of the cable cars by reducing the need for frequent repairs and unscheduled maintenance. This ensures that the fleet remains in service without significant interruptions, maintaining regular service schedules and improving overall system reliability.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06a- Vehicles		
Second Prop L Program (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	This is a placeholder for $18.27 million in Prop L funds for one or more SFMTA projects that are eligible to receive Housing Incentive Pool (HIP) grant program funding. The Metropolitan Transportation Commission's (MTC) HIP Program rewards jurisdictions that have created the most qualifying housing units over the five year period ending with calendar year 2022, including top-ranked San Francisco. San Francisco is likely to be awarded around half of the $71 million in transportation funding available for distribution in mid-2024. MTC proposes to program $18.27 million in MTC RTIP funds reserved for the HIP program to the SFMTA's New Flyer Mid-Life Overhauls Phase III project in exchange for a like amount of Prop L funds for a HIP-eligible SFMTA project or projects. The benefits of this fund exchange include: earlier availability of the HIP funds than if they were in the RTIP (FY31 for RTIP funds); ability for SFMTA to use flexible Prop L funds instead of RTIP funds, which are much more restrictive; and, the mid-life overhauls project would become a top priority for RTIP programming in the region. The $18.27 million in MTC RTIP funds would be added to the $45.569 million in San Francisco RTIP funds that the SFCTA Board recommended programming to the bus overhauls in October 2023. SFMTA will be requesting additional Prop L funds for the mid-life overhauls projects in the Muni Maintenance 5YPP amendment anticipated in Fall 2024.		
Project Location and Limits:	TBD		
Supervisorial District(s):			
Is the project located on the 2022 Vision Zero High Injury Network ?		**Is the project located in an Equity Priority Community (EPC)?**	
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Background: MTC's HIP Program rewards jurisdictions that have created the most qualifying housing units over the five year period ending with calendar year 2022, including top-ranked San Francisco. While final certificates of occupation numbers won't be available until late 2023, based on prior data shared by MTC, San Francisco is likely to be awarded around half of the $71 million in transportation funding available for distribution in mid-2024. A HIP project must be eligible to receive federal One Bay Area Grant 3 (OBAG 3) funds, which are a mix of federal Surface Transportation Program (STP) and Congestion Mitigation and Air Quality (CMAQ) funds.		

Mitigation and Air Quality (CMAQ) funds.

	Proposed Fund Exchange: MTC proposes to program $18.27M in MTC RTIP funds earmarked for the HIP Program to the SFMTA New Flyer Bus Overhaul Phase III project. This would free up a like amount of Prop L funds for a future SFMTA project or projects that are eligible to receive federal OBAG3 funds. SFCTA will work with the Mayor's Office, the Planning Department, SFMTA, and other San Francisco-serving agencies to identify project priorities for the HIP funding. The benefits of this fund exchange include: •Earlier availability of the HIP funds to SFMTA than if they were in the RTIP (FY31 for RTIP funds). •SFMTA will be able to use flexible Prop L funds instead of RTIP funds, which are much more restrictive, for a portion of SF's HIP share. The remainder of SF's HIP share will be federal STP/CMAQ funds. •The New Flyer mid-life overhauls project would become a top priority for RTIP programming in the region.
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	
Type of Environmental Clearance Required:	
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering						
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)						
Advertise Construction						
Start Construction (e.g. Award Contract)						
Operations (i.e. paratransit)						
Open for Use						
Project Completion (means last eligible expenditure)						

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Housing Incentive Pool (HIP) Grant Program Placeholder (RTIP Fund Exchange with Mid-Life Overhauls)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ -	$ -	$ -	
Construction	$ 18,270,000	$ 18,270,000	$ -	Proposed Fund Exchange
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 18,270,000	$ 18,270,000	$ -	
Percent of Total		**100%**	**0%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	TBD	Planned	2024/25	$ 18,270,000	$ -	$ -	$6,090,000	$6,090,000	$6,090,000
				Total By Fiscal Year	**$ 18,270,000**	**$ -**	**$ -**	**$ 6,090,000**	**$ 6,090,000**	**$ 6,090,000**

Notes

This is a placeholder for SFMTA HIP-eligible project(s) TBD. The Transportation Authority expects to see significant leveraging at time of allocation.

This Prop L funding is contingent upon MTC approval (anticipated in December 2023) and CTC approval (anticipated in March 2024) of the 2024 RTIP which will include $18.27 million in MTC (Costra Costa County) RTIP funds for the SFMTA's New Flyer Mid-Life Overhauls project in Fiscal Year 2026/27.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	LRV4 Quarterlife Overhauls Phase I (99 vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Conduct systematic quarterlife rehabilitation and overhauls of targeted vehicle systems on up to 99 of the 219 Siemens light-rail vehicles. These 99 vehicles were placed into revenue service between 2017 and early 2023 and have reached or will soon reach their quarterlife status. The project serves as the first cycle of the LRV4 lifecycle management approach by conducting manufacturer recommended system overhauls and/or planned component replacements on the oldest vehicles in the fleet. This quarterlife overhaul program will be comprised of multiple targeted system campaigns.		
Project Location and Limits:	Citywide		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Conduct systematic quarterlife rehabilitation and overhauls of targeted vehicle systems on up to 99 of the 219 Siemens light-rail vehicles that have already reached or will reach their quarterlife by 2029. The project serves as the first cycle of the LRV4 lifecycle management approach by conducting quarter-life refurbishments on the oldest vehicles in the fleet. Refurbishments include tearing down and replacing materials (such as rubber components) which will not last the 25 years of vehicle life. Overhauls in this project include but are not limited to trucks, brakes, doors, steps, coupler, pantograph, and auxilliary power supply (APS). The first sub-system to be overhauled is the brake system and subsquent priorities will be trucks and couplers. Future projects and campaigns will conduct quarter-life refurbishments on remaining vehicles as well as half life and three quarter- life campaigns for all LRV4 cars.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	N/A		
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	N/A		

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering						
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)						
Advertise Construction						
Start Construction (e.g. Award Contract)		In-house and Contracted	Q3-Jan-Feb-Mar	2024/25		
Operations (i.e. paratransit)						
Open for Use					Q3-Jan-Feb-Mar	2029/30
Project Completion (means last eligible expenditure)					Q4-Apr-May-Jun	2029/30

Notes

Because the quarterlife overhaul plan calls for multiple system overhauls and/or component replacement, planning of these separate activities will be ongoing as will execution (in-house and contracted) throughout the life of the program.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	LRV4 Quarterlife Overhauls Phase I (99 vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ -	$ -	$ -	
Construction	$ 36,256,251	$ 13,900,000	$ 22,356,251	Breda fleet overhaul expenditures escalated
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 36,256,251	$ 13,900,000	$ 22,356,251	
Percent of Total		**38%**	**62%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**
Low Carbon Fuel Sales		Construction	Programmed	2025/26	$375,000	$ -	$ -	$ -	$ -	$ -	$ -
Low Carbon Fuel Sales		Construction	Programmed	2028/29	$503,230	$ -	$ -	$ -	$ -	$ -	$ -
Transportation Sustainability Fee		Construction	Programmed	2024/25	$2,737,921	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2024/25	$666,983	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2025/26	$3,931,385	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2026/27	$1,852,428	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2027/28	$2,523,584	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2028/29	$7,335,903	$ -	$ -	$ -	$ -	$ -	$ -
Operating funds		Construction	Programmed	2024/25	$1,359,684	$ -	$ -	$ -	$ -	$ -	$ -
Operating Funds		Construction	Programmed	2025/26	$1,070,133	$ -	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2026/27	$13,900,000	$ -	$ -	$ -	$6,855,000	$3,522,000	$3,523,000
				Total By Fiscal Year	**$36,256,251**	**$ -**	**$ -**	**$ -**	**$ 6,855,000**	**$ 3,522,000**	**$ 3,523,000**

Notes

When ready to request allocation of Prop L funds for construction, SFMTA must demonstrate a fully funded phase or sub-phase of the proposed scope with adequate leveraging.

Prop L Supplemental Information **Please fill out each question listed below (rows 2-8) for all projects.**	
Project Name	***LRV4 Quarterlife Overhauls Phase I (99 vehicles)***
Relative Level of Need or Urgency (time sensitive)	The flexibility in timing will vary with each sub-system being overhauled. SFMTA engineering is currently creating an Overhaul Plan that will sequence each sub-system project with some systems needing greater timing precision than others. The draft Overhaul Plan should be in place early 2025 (January). However, the first sub-system to be overhauled is the brake system and that overhaul is to begin March of 2025 (delayed approximately 3 months since last reported).
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	The replacement and maintenance of Light Rail vehicles in a state of good repair is essential to delivering rail service to all communities. Current service levels and reliability are committments made to multiple communities and can only be fulfilled with reliable vehicles.
Benefits to Disadvantaged Populations and Equity Priority Communities	Disadvantaged populations and Equity Priority Communities often rely more heavily on public transit as their primary transportation mode. While 20% of San Francisco residents are low income, 38% of Muni riders are low income and 70% of Muni riders are people of color, compared to 63% of city residents. These quarterlife overhauls will help provide safe and reliable transit service to all areas in San Francisco, including all Equity Priority Communities.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Equity, Environmental Sustainability, Economic Vitality, Safety and Livability
	Maintaining vehicles in a state of good repair is essential to meeting all SFTP goals. Without well-maintained vehicles, unplanned failures increase and service is impacted making transit less dependable and ultimately reducing ridership, increasing congestion, and relegating transit to the mode of those who have no other choice.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The LRV4 Quarterlife Overhaul project enhances safety for passengers, operators, and employees by addressing critical vehicle systems, including brakes, propulsion, and HVAC (heating, ventilation, and air conditioning). By conducting systematic overhauls of these systems, the project reduces the likelihood of mechanical failures, which could lead to unsafe conditions such as vehicle breakdowns or compromised climate control within the cabins. Refurbishing doors and cabs ensures safe ingress and egress for passengers and improves operator safety by ensuring that cab systems remain reliable and fully functional. The project's proactive approach to targeted system repairs mitigates potential safety hazards, extending the life of these key safety features before any failures occur.
Need (Asset Useful Life) (Vehicles Sub-program)	The LRV4 Quarterlife Overhaul project aligns with best practices for lifecycle management by performing scheduled overhauls at the quarter-life stage of the Siemens light-rail vehicles (LRVs). These overhauls are conducted on the oldest vehicles in the fleet to ensure they continue to operate safely and reliably for the remainder of their useful life. This quarterlife rehabilitation includes key system repairs and upgrades, such as propulsion, braking, HVAC, and pantograph systems, which are essential for ensuring the vehicles operate smoothly. By addressing these systems proactively, the project ensures that the LRV4s remain in optimal working condition through mid-life and beyond, reducing the need for premature replacements or costly emergency repairs.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	The systematic rehabilitation of LRV4 vehicles ensures that the fleet remains reliable by addressing and refurbishing key components before failures occur. The project targets critical systems, including brakes, propulsion, and HVAC, which directly impact vehicle performance and passenger comfort. By conducting these overhauls, the project reduces the risk of unplanned service interruptions, breakdowns, and costly repairs, thereby improving on-time performance and the overall reliability of the transit system. In addition, by refurbishing older vehicles in a targeted and planned manner, the project extends the life of the fleet and allows the SFMTA to allocate resources more efficiently, avoiding sudden repair costs and minimizing service disruptions.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	New Flyer Midlife Overhauls Phase II		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Perform scheduled mid-life overhauls in accordance with manufacturer recommendations on the New Flyer fleet for vehicles put into service between 2016-2019. Phase II of the overhaul program will include substantial work to 152 40' motor coaches and 69 60' motor coaches, and replace the ISB engines in-house for 40' motor coaches. Rehabilitation of the fleet significantly improves vehicle reliability, reduces incidents of breakdowns, and prevents service interruptions and additional costly repairs. The overhaul scope of work includes engine, propulsion system, pneumatic system, surveillance camera, interior stanchion configuration, flooring, and operator area console refurbishment.		
Project Location and Limits:	Citywide		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Phase II of the overhaul program will include substantial work to 152 40' motor coaches and 69 60' motor coaches, and replace the ISB engines in-house for 40' motor coaches. This overhaul program will address the motor coaches that were accepted and put into revenue service between 2016-2019. The overhaul scope of work includes engine, propulsion system, pneumatic system, surveillance camera, interior stanchion configuration, flooring, and operator area console refurbishment. Using Midlife Overhaul Phase I lessons learned, the scope of the work will remain like-to-like replacement and will not upgrade vehicles to the latest vehicle configuration. An example of latest vehicle configuration includes overhaul, hybrid propulsion system, engine, pneumatic systems, operator console area, HVAC system, and other hydraulic systems. A mid-life overhaul is required for these vehicles to meet their useful life but it does not extend the useful life of the vehicles.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	N/A		
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.			

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering						
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	50%	In-house and Contracted	Q4-Apr-May-Jun	2022/23	Q4-Apr-May-Jun	2024/25
Advertise Construction	100%		Q1-Jul-Aug-Sep	2024/25		
Start Construction (e.g. Award Contract)	0%		Q1-Jul-Aug-Sep	2025/26		
Operations (i.e. paratransit)						
Open for Use					Q4-Apr-May-Jun	2027/28
Project Completion (means last eligible expenditure)					Q4-Apr-May-Jun	2029/30

Notes

SFMTA advertised the contract in July 2024. Board of Supervisors approval is needed by June/July 2025 for Contract Award/issue Notice-To-Proceed by August 2025.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	New Flyer Midlife Overhauls Phase II

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 705,730	$ -	$ 705,730	Based on current Midlife Overhaul Phase I
Construction	$ 119,867,190	$ 12,640,000	$ 107,227,557	Based on current Midlife Overhaul Phase I
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 120,573,287	$ 12,640,000	$ 107,933,287	
Percent of Total		**10%**	**90%**	

Funding Plan - All Phases - All Sources | **Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)**

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Low Carbon Fuel Sales		Design Engineering (PS&E)	Allocated	2022/23	$ 91,331	$ -	$ -	$ -	$ -	$ -
FTA 5337 FY2021		Design Engineering (PS&E)	Allocated	2023/24	$ 173,168	$ -	$ -	$ -	$ -	$ -
Prop B General Fund		Design Engineering (PS&E)	Allocated	2023/24	$ 441,231	$ -	$ -	$ -	$ -	$ -
Low Carbon Fuel Sales		Construction	Programmed	2026/27	$ 470,000	$ -	$ -	$ -	$ -	$ -
STIP		Construction	Allocated	2024/25	$ 7,952,000	$ -	$ -	$ -	$ -	$ -
FTA 5337 FY2022		Construction	Allocated	2023/24	$8,938,313	$ -	$ -	$ -	$ -	$ -
FTA Transit Capital Priorities - FY2025		Construction	Programmed	2024/25	$31,896,602	$ -	$ -	$ -	$ -	$ -
FTA Transit Capital Priorities - FY2026		Construction	Planned	2025/26	$30,000,000	$ -	$ -	$ -	$ -	$ -
Prop B General Fund		Construction	Allocated	2024/25	$1,884,486		$ -	$ -	$ -	$ -
Prop B General Fund		Construction	Programmed	2025/26	$ 818,725	$ -	$ -	$ -	$ -	$ -
Dev Fee-Mission Rock		Construction	Planned	2025/26	$5,267,431	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2025/26	$12,640,000	$ -	$ -	$ 3,000,000	$ 5,000,000	$ 4,640,000
FTA 5337 FY2024		Construction	Programmed	2023/24	$ 20,000,000	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 120,573,287**	**$ -**	**$ -**	**$ 3,000,000**	**$ 5,000,000**	**$ 4,640,000**

Notes

When ready to request allocation of Prop L funds for construction, SFMTA must demonstrate a fully funded phase or sub-phase of the proposed scope with adequate leveraging.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***New Flyer Midlife Overhauls Phase II***
Relative Level of Need or Urgency (time sensitive)	The coaches have reached their mid-life point and it's time sensitive to execute the work per the project schedule in order to maintain the vehicle to meet its useful life. Also, Midlife overhaul is a condition of the Prop K allocation of funds to purchase the vehicles. The timely execution of the Contract and use of Prop L funds as a match is a requirement of the STIP.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	With the state of good repairs, the coaches are more reliable and coach availabilities have improved. In deed, the SFMTA released the full list of findings from its 2023 rider satisfaction survey recently. Agency officials revealed in June that 72% of the surveyed respondents rated Muni service as "excellent" or "good." The share was the agency's highest customer satisfaction rating since the SFMTA first began conducting the annual surveys in 2001
Benefits to Disadvantaged Populations and Equity Priority Communities	Disadvantaged populations and Equity Priority Communities often rely more heavily on public transit as their primary transportation mode. While 20% of San Francisco residents are low income, 38% of Muni riders are low income and 70% of Muni riders are people of color, compared to 63% of city residents. These midlife overhauls will help provide safe and reliable transit service to all areas in San Francisco, including all Equity Priority Communities.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Equity, Safety and Livability, Economic Vitality
	Ensure quality of life and economic health in San Francisco, The primary objective of the transportation system must be the safe and efficient movement of people and goods. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobiles. Within San Francisco, travel by Public transit, by bicycle and on foot must be an attractive alternative to travel by private automobile.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The New Flyer Midlife Overhauls Phase II project improves safety by ensuring that essential bus systems, such as the propulsion, engine, braking, and pneumatic systems, are overhauled and function reliably. The overhaul process includes updates to critical safety features like surveillance cameras, improving security for both passengers and operators by enhancing onboard monitoring. Furthermore, operator area console refurbishment and interior stanchion configurations improve ergonomics and accessibility, reducing the potential for injury during vehicle operation. Maintenance data indicates that rehabilitating these vehicles significantly reduces breakdowns, preventing unsafe operating conditions that could jeopardize the safety of passengers and employees. This proactive approach addresses documented safety risks related to the aging fleet. Conducting the overhaul project on the vehicles is being proactive to address the vehicles issues before components/systems break down during revenue service.
Need (Asset Useful Life) (Vehicles Sub-program)	San Francisco has very challenging operational terrain and the overhaul provides the necessary maintenance attention to bring the vehicle to the end of its useful life without interrupting the revenue service.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	The New Flyer Midlife Overhauls Phase II project supports reliable transportation services by addressing key components that affect vehicle performance, such as propulsion systems, engines, and pneumatic systems. By performing these overhauls, the project reduces the frequency of mechanical failures and breakdowns, which in turn minimizes service interruptions. This helps maintain a more consistent and dependable transit schedule, ensuring that passengers experience fewer delays and disruptions.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	New Jersey PCC Streetcar Midlife Overhauls (16 vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Conduct lifecycle refresh repairs on 16 New Jersey PCC historic streetcars. Improvements to include body work such as roof rust mitigation, upgrades to door motors, propulsion system, traction motors, gearbox and complete truck refresh and rebuild. The mid-life refresh campaign will apply the light rail vehicle useful life standard of 25 years to fully rehabilitated PCC streetcars, conducting necessary life cycle management repairs and refurbishments to ensure continuous reliability and performance of the historic fleet.		
Project Location and Limits:	This project consists of the mid-life overhaul of 16 PCC Historic streetcars that serve the F-line.		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?	N/A		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Conduct lifecycle refresh repairs on 16 New Jersey PCC historic street cars. Improvements would include, but are not limited to: - Bodywork repairs to mitigate rust and corrosion found throughout the fleet in areas such as roof, side panels, floor, and raceways - Door System upgrades including new equipment, upgraded motors and controls - Propulsion control upgrades including contact tips, equipment replacement, etc. - Comprehensive truck rebuild, including rehabilitation of truck frame components, traction motors, running gear, etc. - Upgrades to Auxiliary Electrical Power Supplies		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	N/A		
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	N/A		

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	0%	In-house	Q1-Jul-Aug-Sep	2025/26	Q4-Apr-May-Jun	2025/26
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	0%	In-house	Q1-Jul-Aug-Sep	2026/27	Q3-Jan-Feb-Mar	2026/27
Advertise Construction						
Start Construction (e.g. Award Contract)	0%	TBD	Q4-Apr-May-Jun	2026/27		
Operations (i.e. paratransit)						
Open for Use		TBD			Q4-Apr-May-Jun	2036/37
Project Completion (means last eligible expenditure)	0%				Q4-Apr-May-Jun	2037/38

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	New Jersey PCC Streetcar Midlife Overhauls (16 vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 120,000	$ -	$ 120,000	Prior work and experience
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 140,000	$ -	$ 140,000	Prior work and experience
Construction	$ 33,630,344	$ 947,000	$ 32,683,344	Prior work and experience
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 33,890,344	$ 947,000	$ 32,943,344	
Percent of Total		**3%**	**97%**	

Funding Plan - All Phases - All Sources | **Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)**

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**
Transit Capital Priorities		Planning/Conceptual Engineering	Programmed	2023/24	$ 120,000	$ -	$ -	$ -	$ -	$ -	$ -
Transit Capital Priorities		Design Engineering (PS&E)	Programmed	2025/26	$ 140,000	$ -	$ -	$ -	$ -	$ -	$ -
Transit Capital Priorities		Construction	Programmed	2025/26	$9,104,114	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2025/26	$ 900,000	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Funds		Construction	Programmed	2028/29	$ 503,230	$ -	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2026/27	$ 947,000	$ -	$ -	$ -	$ -	$ 500,000	$ 447,000
TBD (e.g. Prop B, TSF)		Construction	Planned	2029/29	$ 22,176,000	$ -	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 33,890,344**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 500,000**	**$ 447,000**

Notes

At present, the funding plan has a significant $22.2M gap in the construction phase. When SFMTA is ready to request allocation of construction funds, SFCTA will expect a fully funded phase or subphase, with appropriate leveraging.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***New Jersey PCC Streetcar Midlife Overhauls (16 vehicles)***
Relative Level of Need or Urgency (time sensitive)	This project needs to proceed in the proposed timeframe in order for the New Jersey PCC Streetcar fleet to maintain a state of good repair and continue to provide safe and timely F-line service.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	With the state of good repairs, the coaches are more reliable and coach availabilities have improved. Indeed, the SFMTA released the full list of findings from its 2023 rider satisfaction survey recently. Agency officials revealed in June that 72% of the surveyed respondents rated Muni service as "excellent" or "good." The share was the agency's highest customer satisfaction rating since the SFMTA first began conducting the annual surveys in 2001.
Benefits to Disadvantaged Populations and Equity Priority Communities	Disadvantaged populations and Equity Priority Communities often rely more heavily on public transit as their primary transportation mode. While 20% of San Francisco residents are low income, 38% of Muni riders are low income and 70% of Muni riders are people of color, compared to 63% of city residents. These midlife overhauls will help provide safe and reliable transit service to all riders.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Economic Vitality, Safety and Livability, Environmental Sustainability
	PCC Streetcars provide service on the F-line, which serves neighborhoods such as, but not limited to, SOMA, Fisherman's Wharf, and the Embarcadero. This project will increase the reliability of the PCC streetcars servicing this route allowing for the greater support of the economy, people, and businesses in these neighborhoods.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The New Jersey PCC Streetcar Midlife Overhaul project improves safety by conducting critical repairs and updates to the streetcars' propulsion control systems, traction motors, door motors, and braking systems. These systems are essential for the safe operation of the vehicles, and addressing issues such as roof rust and gearbox wear ensures the streetcars remain structurally sound and mechanically reliable. By mitigating these risks, the project prevents potential safety hazards related to mechanical failures, ensuring a safer environment for passengers, operators, and maintenance employees who work on these historic vehicles.
Need (Asset Useful Life) (Vehicles Sub-program)	This project follows best practices for mid-life overhauls, designed to extend the useful life of the 16 historic New Jersey PCC streetcars to a standard of 25 years, consistent with light rail vehicle lifespan expectations. Rather than replacing these iconic streetcars, the project involves comprehensive refurbishments, addressing key systems like propulsion, gearboxes, and traction motors to ensure they continue to operate safely and reliably through the end of their extended service life. Given the streetcars' historical significance, the project focuses on preserving these assets indefinitely, emphasizing ongoing maintenance and lifecycle management to maintain reliability while honoring their cultural value.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	The New Jersey PCC Streetcar Midlife Overhaul project supports reliable transportation by performing necessary repairs and upgrades to critical systems such as propulsion, door operations, and traction motors. These updates minimize the likelihood of mechanical failures and service interruptions, ensuring the PCC streetcars can provide consistent, dependable service for the F-Line. By extending the life of these vehicles through targeted maintenance, the project also enhances efficiency, reducing the need for costly emergency repairs and keeping the streetcars in operation for years to come.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Paratransit Vehicle Replacement (72 Vehicles)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Procure 72 replacement paratransit vehicles as vehicles approach the end of their useful life. Vehicles may include gasoline or electric paratransit cutaway, sedans, and minivans.		
Project Location and Limits:	Citywide		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	N/A
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Procure replacement vehicles as vehicle approach the end of their useful life. Vehicles may include gasoline or electric paratransit cutaway, sedans, and minivans. These modern vehicles will allow the SFMTA to provide more reliable paratransit service and a more comfortable form of transportation for people with disabilities that are unable to access the fixed route transit system. Procurement Schedule as follow: FY28: Procure 47 paratransit vehicles FY29: Procure 25 paratransit vehicles Paratransit service is a criticallly important aspect of transit service in San Francisco. The SFMTA is committed to maintaining the service where possible. By replacing the paratransit vehicles that have reached the end of their useful life, the SFMTA will be able to provide reliable and safe paratransit service that the riding public expects of us. These state-of the art cutaway vehicles will be customized to meet the needs of San Francisco; with slight design adjustments made to the vehicle prior to arriving onsite at our facility. Design specifications are established prior to ordering each vehicle though the State procurement program. The SFMTA is committed to the goal of the full transition to the Zero-Emission fleet as outlined in the Zero-Emission Bus Roll Out Plan that also includes the paratransit fleet. Due to the rapidly evolving nature of the ZEB technologies, the recommended approach in the roll out plan will be adjusted and change over time. For that reason, the SFMTA will continue to evaluate technologies, strategies and the infrastructure upgrades throughout the transition process. The SFMTA is teaming up with industry experts and consultants to develop the Zero Emission Bus Roll Out Plan. SFMTA expect to release this Plan in March 2025.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.			
Type of Environmental Clearance Required:	Categorically Exempt		

Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	

Project Delivery Milestones	**Status**	**Work**	**Start Date**		**End Date**	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering						
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)	0%		Q1-Jul-Aug-Sep	2027/28	Q4-Apr-May-Jun	2029/30
Advertise Construction	0%					
Start Construction (e.g. Award Contract)	0%		Q1-Jul-Aug-Sep	2028/29		
Operations (i.e. paratransit)						
Open for Use					Q4-Apr-May-Jun	2029/30
Project Completion (means last eligible expenditure)					Q2-Oct-Nov-Dec	2030/31

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Paratransit Vehicle Replacement (72 Vehicles)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 325,933	$ -	$ 325,933	Prior procurements
Construction	$ 14,343,107	$ 2,993,000	$ 11,350,107	Prior procurements
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 14,669,040	$ 2,993,000	$ 11,676,040	
Percent of Total		**20%**	**80%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**
FTA Transit Capital Priorities		Design Engineering (PS&E)	Planned	2026/27	$325,933	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FTA Transit Capital Priorities		Construction	Planned	2026/27	$110,680	$ -	$ -	$ -	$ -	$ -	$ -	$ -
FTA Transit Capital Priorities		Construction	Planned	2027/28	$7,018,283	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Fund		Construction	Planned	2027/28	$346,750	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Prop B General Fund		Construction	Planned	2028/29	$950,387	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RM3		Construction	Planned	2026/27	$ 325,000	$ -	$ -	$ -	$ -			
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2027/28	$ 2,993,000	$ -	$ -	$ -	$ -	$ -	$ 2,000,000	$ 993,000
TBD (e.g.,Revenue Bond, TSF, Prop B)		Construction	Planned	2028/29	$ 2,599,040	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 14,669,073**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,000,000**	**$ 993,000**

Notes

Prior to allocation of funds, SFMTA shall present to the Board the results of the Paratransit EV pilot and how it has informed the transition plan to electrify the paratransit fleet.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Paratransit Vehicle Replacement (72 Vehicles)***
Relative Level of Need or Urgency (time sensitive)	This project is to replace vehicles that have reached their useful life. It is important that the project proceed as described in the schedule to avoid delaying vehicle replacement which can affect paratransit service reliability, performance and rider's experience.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	
Benefits to Disadvantaged Populations and Equity Priority Communities	San Francisco Paratransit ("SF Paratransit") is a van and taxi program for people unable to independently use or access public transit because of a disability or disabling health condition. Since 1990, the Americans with Disabilities Act (ADA) has required all public transit agencies to provide paratransit services to eligible disabled people.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Equity, Safety and Livability
	Benefits people with disabilities and seniors by ensuring paratransit vehicles are less likely to be out of service due to maintenance issues and provides newer vehicles with more advanced systems and features.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	Operating vehicle that has reached its useful life may require more maintenance service and some of the component might not be as reliable as vehicle component might be damaged from wear and tear. The Paratransit Vehicle Replacement project improves safety for passengers, operators, and employees by replacing older vehicles that may have outdated safety features with modern vehicles that include state-of-the-art safety technologies. Newer vehicles will be equipped with advanced braking systems, improved restraint systems, and enhanced accessibility features such as ramps and lifts that meet current ADA standards. These features ensure a safer and smoother boarding and alignment process for passengers with mobility challenges, reducing the risk of accidents or injuries. Additionally, the modern vehicles will have improved visibility and ergonomic designs for operators, reducing operator fatigue and enhancing overall driving safety. This project also addresses a documented safety issue of increasing maintenance requirements and mechanical failures in aging vehicles, which pose safety risks due to potential breakdowns during service.
Need (Asset Useful Life) (Vehicles Sub-program)	This project replaces paratransit vehicles that are reaching or have exceeded the end of their useful life. The vehicles being replaced are no longer operating efficiently or reliably due to wear and tear from years of service. Replacing these vehicles ensures that the SFMTA's fleet remains in optimal condition, aligning with best practices for asset management by avoiding costly mid-life overhauls that may not fully address the safety and reliability concerns of aging assets. The replacement vehicles are selected based on their ability to operate safely and reliably through their entire useful life, incorporating updated technologies and designs that meet current safety and environmental standards.
Improves Efficiency of Transit Operations (Vehicles Sub-program)	The Paratransit Vehicle Replacement project directly supports reliable transportation services by ensuring that the fleet used to provide these essential services is composed of modern, dependable vehicles. By replacing aging vehicles with new, more fuel-efficient or electric models, the project reduces the likelihood of vehicle breakdowns and service interruptions, thereby improving on-time performance and reliability. These vehicles are designed to be more efficient in terms of fuel consumption and maintenance needs, which helps reduce operational costs and minimizes downtime due to repairs. The procurement of newer vehicles also enhances the customer experience by providing a smoother, more comfortable ride, further supporting the SFMTA's commitment to delivering high-quality transit services.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	The Portal (RTIP Fund Exchange with Mid-Life Overhauls)		
Implementing Agency:	TJPA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06a- Vehicles		
Second Prop L Program (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	Extension of Caltrain from Fourth and King Streets to the Salesforce Transit Center at First and Mission Streets, with accommodations for future high-speed rail. This programming would be the result of a dollar-for-dollar fund exchange of Regional Transportation Improvement Program (RTIP) funds and Prop L. The fund exchange enables the Transportation Authority to fulfill its RTIP commitment to The Portal, which can't receive the RTIP funds directly since the project's progressive design build approach doesn't easily comply with RTIP guidelines. In October 2023, the Transportation Authority Board recommended programming the RTIP funds to the SFMTA's New Flyer Mid-Life Overhauls Project Phase III conditioned upon approval of the subject fund exchange, which would be approved as part of the Muni Maintenance 5YPP adoption.		
Project Location and Limits:	Fourth and Townsend Streets to the Salesforce Transit Center at First and Mission Streets		
Supervisorial District(s):	Citywide, District 06		
Is the project located on the 2022 Vision Zero High Injury Network ?	No	**Is the project located in an Equity Priority Community (EPC)?**	Yes
Which EPC(s) is the project located in?	Tenderloin-SOMA		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g.	The DTX will extend Caltrain rail service from its current terminus at Fourth & King to the Salesforce Transit Center in downtown San Francisco via the DTX. The project will bring communities closer, reduce greenhouse gas emissions and provide Bay Area residents improved access to jobs, housing and economic opportunities. The DTX will connect Caltrain's regional commuter rail system and the California High-Speed Rail Authority's future statewide intercity rail system to the Salesforce Transit Center (Center) in downtown San Francisco. The rail alignment will be constructed principally below grade between the existing Caltrain terminus south of downtown and the Center at First and Mission streets. The main elements of the DTX are a tunnel, ventilation and emergency egress shafts and		

	structures, systems, trackwork, railyard sitework, and extension of the Center's existing below-grade train box to allow for longer platforms, ventilation, and emergency egress. Two new stations—the Salesforce Transit Center station and a new underground station at Fourth and Townsend streets—will be constructed as part of the DTX. Community engagement will continue throughout the design and construction of the project. The Transportation Authority Board has long-standing Regional Transportation Improvement Program (RTIP) priorities which currently direct RTIP funds to the Central Subway, MTC Advance for Presidio Parkway, and $17.8 million for The Portal, in that order until the commitments are filled. TJPA is currently working with the Federal Transit Administration (FTA) to submit its financial plan and request entry into engineering as part of its efforts to secure a $4+ billion Capital Investment Grant (CIG). To support this time sensitive effort and position the project well, In October 2023 the Transportation Authority Board recommended fulfilling the RTIP priorities out of order by funding The Portal through the 2024 RTIP. This requires a fund exchange with Prop L since the project's progressive design build approach doesn't easily comply with California Transportation Commission (CTC) RTIP guidelines. SFMTA staff has agreed to a cost-neutral Prop L/RTIP fund exchange that involves Prop L funds that would have been proposed for the New Flyer Midlife Overhaul-Phase III project in the Muni Maintenance 5YPP. This request for the $17,847,000 in Prop L / RTIP exchange funds are anticipated to be applied toward the project's construction activities in FY30 and FY31. TJPA anticipates that these costs could be incurred for construction of the DTX tunnel and structures, track & systems, or station fit-out.
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Att 1. Project alignment map Att 2. Project Schedule Att 3. Project benefits along with cross-section showing the already built two-level trainbox. Att 4. Proposed funding plan
Type of Environmental Clearance Required:	EIR
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	Jesse Koehler, SFCTA plus our other MOU project partners, including: - Morgan Galli, California High-Speed Rail Authority - Georgia Gann Dohrmann, Metropolitan Transportation Commission - Casey Fromson, Caltrain - Alex Sweet, City & County of San Francisco

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	100%	Contracted	Q2-Oct-Nov-Dec	Previous	Q2-Oct-Nov-Dec	Previous
Environmental Studies (PA&ED)	100%	Contracted	Q2-Oct-Nov-Dec	Previous	Q2-Oct-Nov-Dec	2019/20
Right of Way	0%	Contracted	Q4-Apr-May-Jun	2021/22	Q4-Apr-May-Jun	2024/25
Design Engineering (PS&E)	30%	Contracted	Q2-Oct-Nov-Dec	2021/22	Q2-Oct-Nov-Dec	2025/26
Advertise Construction	0%	Contracted	Q2-Oct-Nov-Dec	2025/26		
Start Construction (e.g. Award Contract)	0%	Contracted	Q2-Oct-Nov-Dec	2025/26		
Operations (i.e. paratransit)						
Open for Use					Q2-Oct-Nov-Dec	2032/33
Project Completion (means last eligible expenditure)					Q2-Oct-Nov-Dec	2033/34

Notes

Schedule is subject to funding availability.

Project Name:	The Portal (RTIP Fund Exchange with Mid-Life Overhauls)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ -	$ -	$ -	
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ 351,641,000	$ 25,000,000	$ 326,641,000	Eng. Est.@ 30%
Design Engineering (PS&E)	$ 583,963,000	$ 65,000,000	$ 518,963,000	Eng. Est. @ 30%
Construction	$ 7,319,663,000	$ 227,847,000	$ 7,091,816,000	Eng. Est. @ 30%, including The Portal ($7.562B) and Trainbox ($729M)
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 8,255,267,000	$ 317,847,000	$ 7,937,420,000	
Percent of Total		**4%**	**96%**	

Funding Plan - All Phases - All Sources — **Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)**

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**	**2028/29**	**2029/30**	**2030/31**	**2031/32**	**2032/33**
Prop L / RTIP Fund Exchange	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Construction	Planned	2027/28	$ 17,847,000	$ -	$ -	$ -	$ -		$ -	$ -	$ 8,924,000	$ 8,923,000	$ -
Prop L	05- Caltrain Downtown Rail Extension and Pennsylvania Alignment	Right of Way	Planned	2024/25	$ 25,000,000	$ -	$ 25,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Prop L	05- Caltrain Downtown Rail Extension and Pennsylvania Alignment	Design Engineering (PS&E)	Planned	2026/27	$ 65,000,000	$ -	$ -	$ -	$ 25,000,000	$ 40,000,000	$ -	$ -	$ -	$ -	$ -
Prop L	05- Caltrain Downtown Rail Extension and Pennsylvania Alignment	Construction	Planned	2028/29	$ 210,000,000	$ -	$ -	$ -	$ -	$ -	$ 40,000,000	$ 40,000,000	$ 40,000,000	$ 40,000,000	$ 50,000,000
Prop K		Design Engineering (PS&E)	Allocated	2021/22	$ 21,589,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TIRCP		Design Engineering (PS&E)	Allocated	2023/24	$ 60,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RM3		Right of Way	Programmed	2023/24	$ 129,145,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RM3		Construction	Programmed	2024/25	$ 95,155,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Local Land-Based Sources		Design Engineering (PS&E)	Allocated	2021/22	$ 162,013,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Local Land-Based Sources		Right of Way	Programmed	2023/24	$ 96,796,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Local Land-Based Sources		Construction	Programmed	2026/27	$ 559,391,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TIRCP, HSR, Other State Funds		Construction	Programmed	2025/26	$ 1,050,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TBD		Design Engineering (PS&E)	Planned	TBD	$ 275,361,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
TBD		Construction	Planned	TBD	$ 4,658,270,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
RM3		Right of Way	Allocated	2023/24	$ 100,700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
ARRA for train box		Construction	Allocated	Previous	$ 400,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Non-federal for train box		Construction	Allocated	Previous	$ 329,000,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 8,255,267,000**	**$ -**	**$25,000,000**	**$ -**	**$ 25,000,000**	**$ 40,000,000**	**$ 40,000,000**	**$ 40,000,000**	**$ 48,924,000**	**$ 48,923,000**	**$ 50,000,000**

Notes

See attachment 4 for full funding plan details including potential sources of TBD funds.

Prop L EP 5 Caltrain Downtown Extension and Pennsylvania Alignment funds are subject to Transportation Authority Board approval in a future round of 5YPP adoption, anticipated in February 2024. The EP 5 funds are not being recommended in this 5YPP, but are shown for reference.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***The Portal (RTIP Fund Exchange with Mid-Life Overhauls)***
Relative Level of Need or Urgency (time sensitive)	Supplemental information will be provided in the Project Information Form for the Caltrain Downtown Rail Extension and Pennsylvania Alignment 5YPP.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	N/A
Benefits to Disadvantaged Populations and Equity Priority Communities	N/A
Compatability with Land Use, Design Standards, and Planned Growth	
San Francisco Transportation Plan Alignment (SFTP)	
	N/A


The Portal - Key Regional Rail Connection
San Francisco
Project Area
Millbrae
Santa Clara
San Jose
CALIFORNIA High-Speed Rail Authority
Caltrain
Gilroy
To LA
Caltrain stations
Salesforce Transit Center
Future Rail Crossing
Second Street
80
Fourth and Townsend Street Station
Townsend Street
PAX
to San Jose & Los Angeles
N
THE PORTAL
TJPA
Six vent and emergency egress structures
Existing railyards and Caltrain station at Fourth and King
2.2-mile alignment and two stations
Pedestrian surface improvements on Beale Street
Delivered by others
San Francisco County Transportation Authority
Pennsylvania Ave. Extension (PAX)
LINK21

Attachment 2

Project Schedule

TJPA
TRANSBAY JOINT POWERS AUTHORITY

THE PORTAL
UNITING THE BAY. CONNECTING CALIFORNIA.

NEPA/CEQA ENVIRONMENTAL CLEARANCE — 2019

- TJPA Board certification December 2018
- FTA Record of Decision July 2019

PROJECT DEFINITION — 2020

- Phasing study
- Financial plan
- Technical studies

PROJECT DEVELOPMENT & ENGINEERING — 2022

- New Starts requirements
- Design
- Third-party agreements

COMPLETED

PROJECT DELIVERY* — 2023

- Advance contracts
- Procurement
- Entry to Engineering

2025

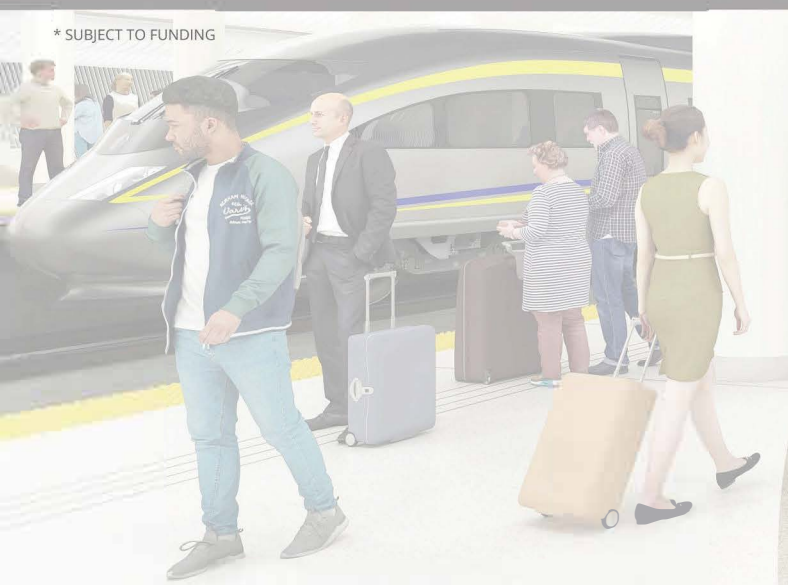
- FFGA approval
- Civil & tunnel construction

CONSTRUCTION

TARGET READY FOR SERVICE* — 2032

COMMUNITY ENGAGEMENT

* SUBJECT TO FUNDING



TJPA
TRANSBAY JOINT POWERS AUTHORITY

THE PORTAL
UNITING THE BAY. CONNECTING CALIFORNIA.

THE PORTAL WILL:

ENVIRONMENT:
BUILD A GREEN AND SUSTAINABLE FUTURE

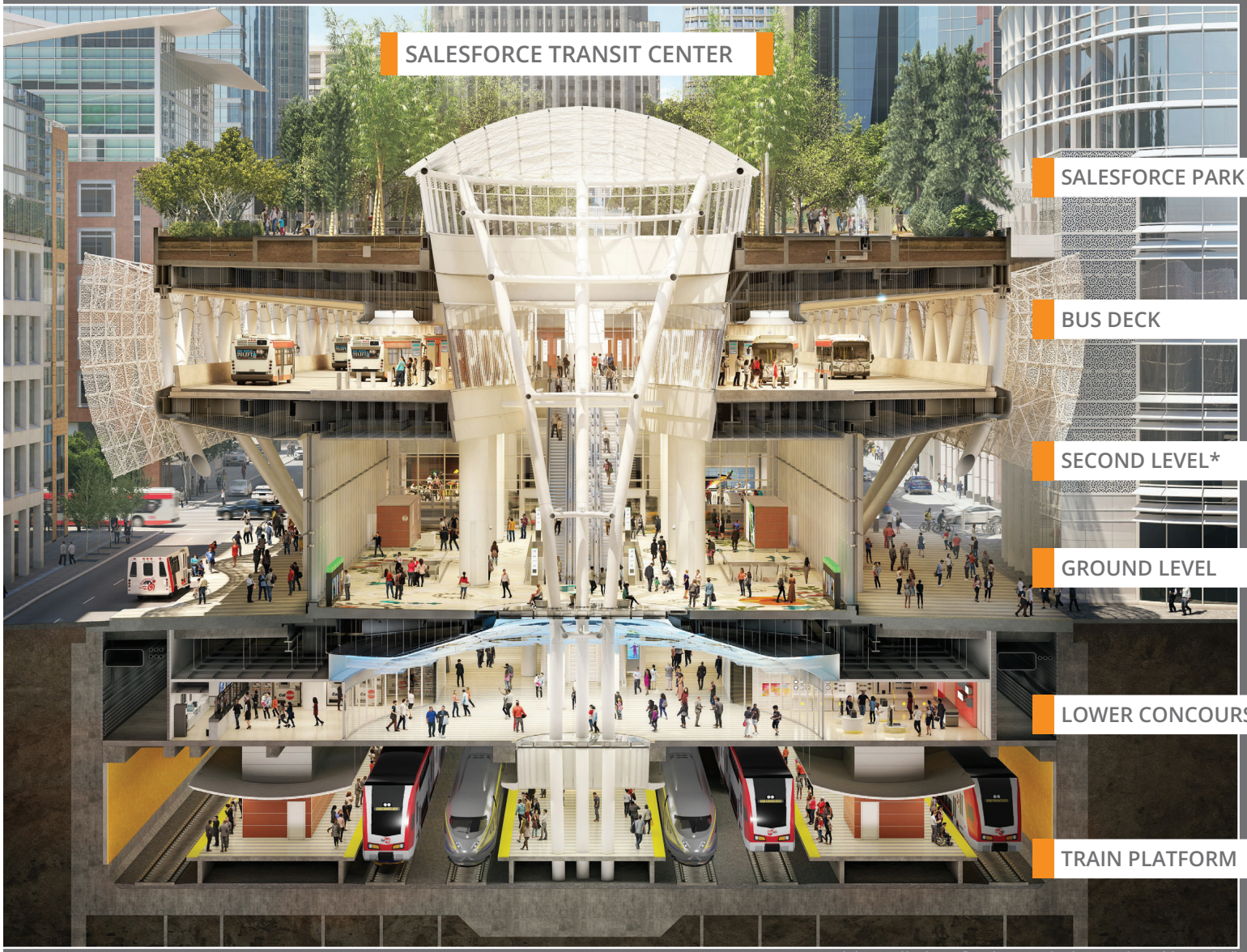
- Decrease traffic congestion
- Reduce greenhouse gas emissions

ECONOMY:
CATALYZE ECONOMIC GROWTH AND PROSPERITY

- Create new housing and jobs within walking distance of the two new San Francisco rail stations
- Expand public transit access to businesses and workers across the State
- Provide construction-related opportunities for workers within the region and beyond

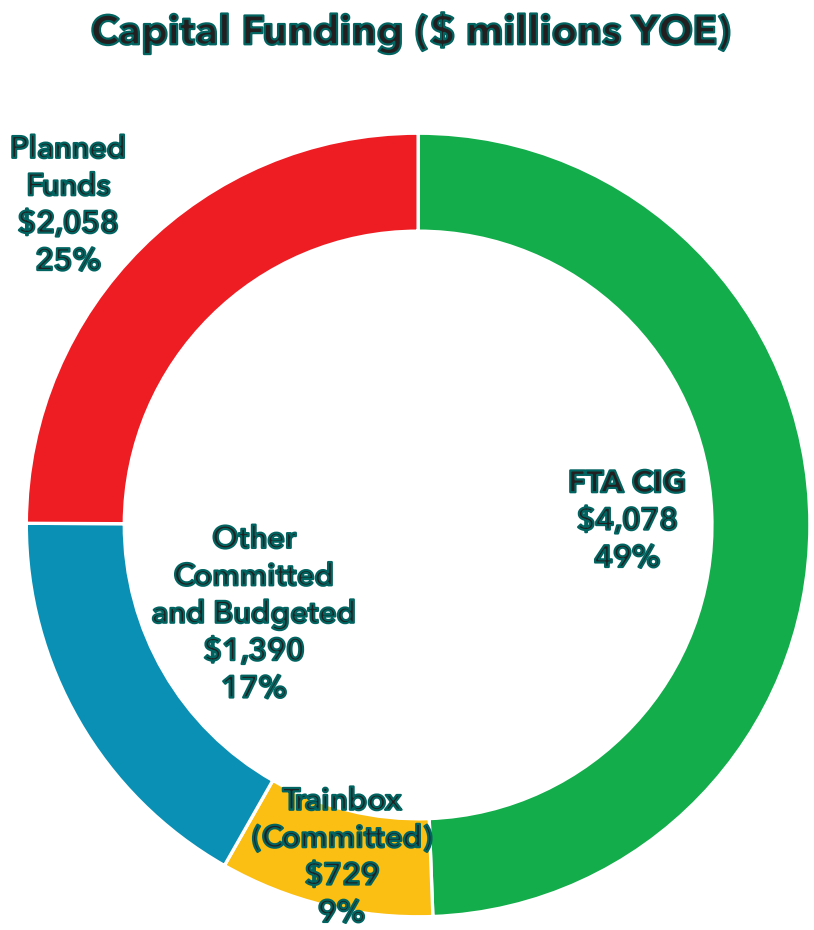
EQUITY:
ADVANCE ENVIRONMENTAL JUSTICE AND BUILD A MORE EQUITABLE FUTURE

- Improve public transit access for communities in underserved areas to better connect to jobs, healthcare, education, and cultural resources
- Provide underrepresented groups with job opportunities and engagement with small, disadvantaged, and veterans business enterprise programs



* The second level is one floor above ground to the west and east of the Grand Hall.

The Portal: Capital Cost and Funding



CAPITAL COST AND FUNDING	$M YOE
CAPITAL COST	**8,255**
Trainbox	729
The Portal	7,526
CAPITAL FUNDING	
FTA New Starts CIG	4,078
Trainbox (Completed/Committed)	729
Other Committed/Budgeted Funds	1,390
Planned Funds	2,058
TOTAL FUNDING PLAN	**8,255**

1

Committed and Budgeted Funding

COMMITTED/BUDGETED FUNDING	$YOE, M
LOCAL/REGIONAL	**1,659**
Transbay Transit Center CFD	355
Transbay Transit Center Impact Fees	16
Transbay Redevelopment Tax Increment	225
San Francisco Proposition K	22
San Francisco Proposition L	300
MTC Regional Measure 3	325
Parcel F Funds	62
Block 4 Land Sale Proceeds	6
Prop L/RTIP Fund Exchange	18
Caltrain Contribution for Engineering	3
Prior Non-Federal for Train Box	329
STATE	**60**
TIRCP – Project Development	60
FEDERAL	**400**
ARRA for Train Box	400
TOTAL	**2,119**

Planned and Potential Funding (Non-CIG)

PLANNED/POTENTIAL FUNDING	$YOE, M
LOCAL/REGIONAL	
Other IPIC Plan Areas (e.g., Central SOMA)	155
New Expanded Transit District Sources	TBD
Additional/Future Local Sources	TBD
Additional/Future Regional Sources	TBD
Other Funding (PFC, Private, etc.)	TBD
STATE	
TIRCP – Construction	500
CHSRA – Engineering	3
HSR (State/Federal Funds and/or CHSRA TBD)	550
FEDERAL	
FRA F-S Partnership Grant Request Submitted	97
USDOT MEGA Grant Request Submitted	114
Future Non-CIG Federal (e.g., BIL Programs)	TBD
TOTAL	**2,058**

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Cable Car Barn Rehabilitation		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The Cable Car Barn Rehabilitation Project will environmentally clear a program of projects to upgrade and rehabilitate various capital components at the historic facility including replacing obsolete electrical equipment, modernizing the electrical infrastructure of the cable car fleet, and improvements to the Cable Car Barn Museum. Other capital improvements include, but are not limited to, crane replacement, restroom and office upgrades, accessibility improvements, passenger and freight elevator replacement, roof replacement, and seismic retrofitting. This Prop L request will also fund design of critical upgrades to the 12kV electric power system.		
Project Location and Limits:	The Cable Car Barn is located at 1201 Mason Street and is bounded by Jackson Street, Washington Street, Taylor Street, and Mason Street in the Nob Hill neighborhood of San Francisco.		
Supervisorial District(s):	Citywide, District 3		
Is the project located on the 2022 Vision Zero High Injury Network ?	No	**Is the project located in an Equity Priority Community (EPC)?**	No
Which EPC(s) is the project located in?	N/A		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	The Cable Car Barn (CCB) and the cable car fleet it houses are each registered as historic landmarks, both nationally and in the State of California; and work must conform to the Secretary of the Interior's Standards for Treatment of Historic Properties. The building was originally built in 1888 but was severely damaged in the 1906 Great Earthquake. The most recent rehabilitation in 1984 included substantial renovations and additions. After four decades, the facility needs rehabilitation to efficiently and safely maintain continued operations of the cable car service for the future. The overall purpose of this project is to complete a variety of critical capital improvements that are needed at the historic CCB to improve working conditions at the facility - including the CCB Museum, replace obsolete, critical electrical equipment, and modernize the electrical infrastructure of the cable car fleet. Other critical capital improvements include, but are not limited to, crane replacement, restroom and office upgrades, accessibility improvements, passenger and freight elevator replacement, roof replacement, and seismic retrofitting. However, due to financial constraints to rehabilitate the Cable Car Barn in its entirety, the proposed scope is targeting the critical upgrade of the 12kV electrical power as the top priority at the facility. This work will be designed to address the obsolete electrical infrastructure and procured as an enabling project to still fit within the overall phased approach developed in planning phase. Prop L funds are requested for environmental review of the full scope of the project and the design for the 12kV electrical power system. This is reflected in the Cost & Funding tab. The Cable Car Barn Project is directly related to the following SFMTA Strategic Plan Goals: • Goal 5 - Deliver reliable and equitable transportation services, • Goal 9 - Fix things before they break, and modernize systems and infrastructure, • Goal 10 - Position the agency for financial success. Outreach will be conducted during the design and construction phases of the project to both notify the CCB operations team, transit operators, and the public of upcoming work, and to provide an opportunity for input as well as coordination regarding the facility upgrades and necessity of cable car shutdowns. The scope of the electrical power upgrades will affect the Cable Car operations. While power shutdowns are anticipated for non-revenue hours, the SFMTA staff, transit planning, transit operators, and the public will be made aware of potential service outages, delays, and alternative means of transportation.		

Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Attachment 1: Final Cable Car Barn Master Plan Report, May 2023 Attachment 2: SFMTA Citizen's Advisory Council (CAC) - Engineering, Maintenance, and Safety Committee (EMSC) Meeting, February 22, 2023 and March 24, 2024 Attachment 3: Supplemental Info - Relative Level of Need or Urgency - Additional Detail
Type of Environmental Clearance Required:	Environmental Assessment (EA)
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	SFMTA Environmental Review Team, SF Planning Department, NEPA Region 9 (environmental clearance), SF Department of Building Inspections (DBI), SF Public Utilities Commission, Pacific Gas & Electric (PG&E), SF Public Works - Site Assessment and Remediation (SAR), SF Department of the Environment, and the local community neighborhood groups through SFMTA Public Outreach and Engagement Team (POET).

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/ Preliminary Engineering	90%	In-house	Q1-Jul-Aug-Sep	2020/21	Q3-Jan-Feb-Mar	2024/25
Environmental Studies (PA&ED)	0%	Contracted	Q1-Jul-Aug-Sep	2025/26	Q4-Apr-May-Jun	2027/28
Right of Way	0%					
Design Engineering (PS&E)	0%	In-house and Contracted	Q1-Jul-Aug-Sep	2026/27	Q4-Apr-May-Jun	2027/28
Advertise Construction	0%		Q1-Jul-Aug-Sep	2028/29		
Start Construction (e.g. Award Contract)	0%		Q3-Jan-Feb-Mar	2028/29		
Operations (i.e. paratransit)	0%					
Open for Use	0%				Q3-Jan-Feb-Mar	2031/32
Project Completion (means last eligible expenditure)	0%				Q1-Jul-Aug-Sep	2032/33

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Cable Car Barn Rehabilitation

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 3,317,131	$ -	$ 3,317,131	Actuals/cost to complete
Environmental Studies (PA&ED)	$ 2,000,000	$ 2,000,000	$ -	Historical data for NEPA environmental work
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 3,496,000	$ 3,496,000	$ -	Engineer's CIP Estimate
Construction	$ 14,873,211		$ 14,873,211	Engineer's CIP Estimate as of February 2025
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 23,686,342	$ 5,496,000	$ 18,190,342	
Percent of Total		**23%**	**77%**	

Environmental review for entire scope of project

Cost of upgrading the 12kV electric power system

Cost of upgrading the 12kV electric power system

Funding Plan - All Phases - All Sources

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Environmental Studies (PA&ED)	Planned	2025/26	$ 2,000,000	$ -	$ 400,000	$ 800,000	$ 800,000
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Design Engineering (PS&E)	Planned	2026/27	$ 3,496,000	$ -	$ -	$ 1,496,000	$ 2,000,000
TBD (e.g. FTA 5337, SB1 SGR, or Prop B)		Construction	Planned	2027/27	$ 14,873,211	$ -	$ -	$ -	
Transit Infrastructure Grant (TIG) FY22		Planning/Conceptual Engineering	Allocated	2022/23	$ 2,000,000	$ -	$ -	$ -	$ -
SB1 SGR FY18		Planning/Conceptual Engineering	Allocated	Previous	$ 1,317,131	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 23,686,342**	**$ -**	**$ 400,000**	**$ 2,296,000**	**$ 2,800,000**

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Prop L Supplemental Information Please fill out each question listed below (rows 2 8) for all projects.	
Project Name	***Cable Car Barn Rehabilitation***
Relative Level of Need or Urgency (time sensitive)	The historic Cable Car Barn (CCB) requires a variety of critical capital improvements that are needed to improve employee working conditions at the facility - including the CCB Museum, replace obsolete, critical electrical equipment, and modernize the electrical infrastructure of the cable car fleet. The recommendation of the Master Plan concluded that conversion to 12kV electrical power is the top priority at the facility after four decades in use since the 1984 major renovation. The level of need and urgency is critical. The electrical equipment replacement and new electrical room along with all associated work including the new dual, separate PG&E electrical feeders are a priority to the SFMTA. While the cable cars generate revenue for the SFMTA, continuity and service resiliency of operations have a significant impact to the City. Cable Cars are iconic to San Francisco and play a significant role in the City's tourism industry. Cable Car Barn Rehabilitation project requires funding to perform the environmental work for CEQA and NEPA clearance. Obtaining environmental clearance provides project preparedness to pursue new funding avenues and advancing design phases. SFMTA has selected As-Needed Environmental Consultants who can perform this work. However, funding for this professional services contract is required before a contract can be awarded. See attached Relative Level of Need or Urgency Section with additional detail.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	The Cable Car Barn (CCB), located on Nob Hill of San Francisco, is not located in the Equity Priority Community (EPC). The cable car service does not emit greenhouse gases by its historic technological use of cables below the streets to power (pull) the cars through the city. Little did the forefathers of the cable car technology know it would be a harbinger of today's Transit First Policy and transportation sustainability goals. SFMTA's Public Outreach and Engagement Team (POETs) has performed extensive outreach to the community and neighborhood over the years due to the historic nature of and civic decorated functions at the Cable Car Barn. Some recent outreach includes Cable Car Gearbox Project, Quick Implementation (QI) Project for the historic barn door replacement, and now outreach to commence for the Cable Car Barn Rehabilitation project. This current CCB project was presented to representatives of the SFCTA Citizens Advisory Committee (CAC) to the Engineering, Maintenance, and Safety Committee (EMSC) in February 2023 and recently April 24, 2024. The Public Outreach and Engagement Team (POET's) Plan for CCB is in the Appendix of the Pre-Development Report (PDR).
Benefits to Disadvantaged Populations and Equity Priority Communities	While the Cable Car Barn Rehabilitation Project is not located in an Equity Priority Community, a robust cable car system benefits disadvantaged communities in San Francisco. Specifically, the 3 different cable car lines provide important transit access throughout the northeast section of the City, including the Financial District, popular tourist attractions such as Fisherman's Wharf, and Chinatown that is home to many low-income and elderly residents. By ensuring that the Cable Cars are effectively running, the Cable Cars provide increased mobility to all residents living in the area or that need to visit the area for employment, recreational, and other opportunities that improve their well-being. Without this diverse mode of public transporation, residents have less independent and safe transporation choices to reach their destination.

Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Economic Vitality, Safety and Livability
	As the only City in the United States that uses cable cars for public transporation, cable cars are considered national landmarks and an iconic symbol of San Francisco. The 3 different cable car lines provide enjoyable transit access to popular tourist attractions such as Fisherman's Wharf, Chinatown, Union Square, Ghiradelli Square and Nob Hill.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The rehabilitation of the historic Cable Car Barn has a variety of critical capital improvements that are needed to improve Muni employee working conditions and work efficiencies at the facility, including the CCB Museum. The scope of work includes replacement of obsolete electrical equipment, crane replacement, restroom and office upgrades, accessibility improvements, passenger and freight elevator replacement, roof replacement, and seismic retrofitting. The replacement of obsolete 12kV switchgear equipment particularly is critical to ensure the safety and reliability of cable car operations. Upgrades to the 12kV electrical infrastructure will bring required clearances around electrical equipment into code compliance and improve the electrical service at the CCB for new equipment necessary to perform operations maintenance and repair of the cable cars. The rehabilitation project in general will ensure that the facility continues its safe track record for employees working in the office to the repair floor to the employee workspace at the Barn. It ensures safety of personnel, protection of equipment and vehicles, and safe movement of cable cars.
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	The Cable Car Barn is considered the crown jewel of the SFMTA system. It is admired and a destination visit to out-of-towners adding to the City's tourism industry. In order to sustain this, the existing facilities in the CCB have to be brought up to a State of Good Repair (SoGR). As equipment and systems reach the end of their serviceable life expectancy, new replacements will avoid significant negative impact in the power system, create work efficiencies and improve safety in the workplace for Muni's employees. The 12kV has reached the end of its useful life which is in its 4th decade of operation when typically main switchgears are estimated to be serviceable for 25-30 years. The switchgear and associated electrical infrastructure is the heart of the Cable Car Barn supplying power to the cable system propulsion of the cable car lines and delivering power to the facility functions. New facility power services are required for capital improvement upgrades in the Barn. The bridge cranes need to be upsized to be more efficient to handle weights of material that the existing cranes are now deficient in conveying. Parts storage is spread throughout the CCB and the inventory system is antiquated, but if replaced by new containerized compact parts storage will take less footprint and will be more efficient in storing and retrieving parts. Passenger and freight elevators need to be replaced to comply with current standards (and accessibility for the passenger elevators) and programmatic functional requirements. And the overall facility for the occupied spaces will be designed to be more energy efficient.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	This improved workspace will add value to the training of new skilled staff to continue the apprentice-acquired (hand-eye) trades that exist and is the backbone of the future of the Cable Car in San Francisco. This is a unique skill set that is difficult to replace as staff retire or change out.

A13 - Cost Estimate

SAN FRANCISCO CABLE CAR BARN
AT
1201 MASON STREET
SAN FRANCISCO, CA

ROM CONSTRUCTION COST ESTIMATE
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON
Final Master Plan Documents

Owner:
SAN FRANCISCO MUNICIPAL TRANSPORATION AGENCY
Attention:
Email:

Prepared for
SAN FRANCISCO PUBLIC WORKS
Attention: EunJoo Cho, RA, NCARB, LEED BD+C
Email: eunjoo.cho@sfdpw.org

Prepared by:
M LEE CORPORATION
Attn: Franklin Lee, PE, LEED AP BD+C, CEP
Certified Estimating Professional
415-693-0236; flee@mleecorp.com

Date: 07/22/2022 Final

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS

Table of Contents

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
1.0 BASIS OF ESTIMATE

Date: 07/22/2022 Final

1.0 Outline

1.1 The purpose of this estimate is to provide a preliminary opinion of probable construction costs based on the Master Plan documents as a budget guideline for further study. The procedure we followed in developing this estimate is consistent with industry standards.

1.2 The preliminary construction cost estimate, which represents our opinion of probable construction costs, is comprised of the following integral parts:
A) Basis of Estimate
B) Estimate Summaries
C) Estimate Details

2.0 Documents used for the Estimate

2.1 This Estimate is based on the following documents:
1 2022-0328_Cable Car Barn Draft Master Plan - DPW MTA 1708 CCB Cp,,emts _EW_EC_FINAL
2 2022-0615_CCB Master Plan Report
3 2022-0616-CCB_A summary of changes for Cost Estimator_All
4 Werner Quote _5.2.22
8 Crane & Hoist Service Quote_5.6.22

3.0 Scope

3.1 The general scope of work called out on drawings listed above including:
Phase 1A:
12KV Electrical Upgrade
Phase 1B:
20ton Bridge Crane Upgrade
Phase 2:
Office improvements
Phase 3A:
Programming Restructuring
Phase 3B:
Carpentry Improvements
Phase 4:
Roof Improvements
Phase 5:
Seismic Improvements
Exterior Improvements
Winding Motors

3.2 Items specifically excluded from the estimate:
Hazmat abatement, except where noted
Legal fees and finance costs

Permit & plan check fees
Utility connection fees
Owner's administration costs
Design services
Survey services, materials lab
Project/Construction management
Other soft costs
Construction Contingency
Project contingency

It is assumed that the above items, if needed, are included elsewhere in the owner's overall project budget.

4.0 Assumptions and Qualifications

4.1 The estimate is based on estimated prices current as of July 2022, with a minimum of four responsible and responsive bids under a competitive bidding environment for a fixed price lump sum contract (a fair market condition).

Note: Experience indicates that fewer bidders may result in higher bids, and conversely more bidders may result in more competitive bids. Therefore it is important to obtain as many bids as possible.
The following table provides a general guideline for probable impacts due to number of bids:

1 bid	+20% to +50%
2-3 bids	+10% to +20%
4-5 bids	0% to +10%
6-7 bids	0% to -10%
8 or 10 bids	-10% to -20%

4.2 Working hours and phasing
The estimate is based on all work to be performed during regular working hours. No overtime or weekend hours are included.
The estimate is based on all work being done concurrently. The estimate summary includes a rough cost impact for phasing the work.

4.3 Allowances have been used for items which are required but are not able to be defined at this time.

4.4 The unit prices used in the direct cost section are composite unit prices which include costs for material including tax, labor, equipment and subcontractor's/supplier's mark-ups.

4.5 The following markups have been included at the estimate summary level

a) GC's General Conditions and General Requirements
b) Market factor
b) GC's OH&P
c) Bonding and Insurance
d) Design Development Estimating Contingencies due to the conceptual nature of the scope. This amount will be gradually reduced as design progresses and more detail can be captured within the direct costs
e) Cost Escalation, see escalation section for details

4.6 Items potentially affecting the cost estimate include, but are not limited to, the following:
Modifications to the scope of work included in this estimate.
Unforeseen sub-surface conditions.
Special phasing requirements.
Restrictive technical specifications or excessive contract conditions.
Any specified item of equipment, material, or product that cannot be obtained from at least three different sources.
Any other non-competitive bid situations.

4.7 Client acknowledges that our estimating service is consistent with and limited to the standard of care applicable to such services, i.e. we provide our services consistent with the professional skill and care ordinarily provided by consultants practicing in the same or similar locality under the same or similar circumstances. The estimate is intended to be a determination of fair market value for the project construction. Since we have no control over market conditions, costs of labor, materials, equipment and other factors, which may affect the bid prices, we cannot and do not warrant or guarantee that bids or ultimate construction costs will not vary from the cost estimate. We make no other warranties, either expressed or implied, and are not responsible for the interpretation by others of the contents herein the cost estimate.

4.8 It should also be noted that the cost estimate is a "snapshot in time" and that the reliability of this opinion of probable construction cost will inherently degrade over time.

4.9 Please note that the estimate has been based on very preliminary information and it only serves as a general guideline for more specific and detailed studies in the future. This estimate should be updated when more design or scope information is available.

5.0 **Terminology**
Please note that:
1) Direct Cost = Estimated construction cost at working contractor's level/trades level.
2) Base Construction Cost = Estimated construction bid submitted by general contractor to Owner, including general contractor's markups and contingency

6.0 **Abbreviations used in the estimate:**

CF = cubic foot
CY = cubic yard
(E) = existing
EA = each
GSA = Gross Square Area
GSF = Gross Square Feet
LB = pound
LF = linear foot
FLT = flight
LOC = location
LS = lump sum
(N) = new
NIC = not in contract
OFCI = owner furnished contractor installed
PR = pair
ROM = rough order of magnitude
SF = square foot

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST **Date: 07/22/2022 Final**
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
1.1 ESCALATION CALCULATION

PHASE 1

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to midpoint of construction

Total escalation	**32.63%**	to Summary

PHASE 2

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to

Total escalation	**32.63%**	to Summary

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST **Date: 07/22/2022 Final**
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
1.1 ESCALATION CALCULATION

PHASE 3

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to
Total escalation **32.63%** to Summary

PHASE 4

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to
Total escalation **32.63%** to Summary

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST **Date: 07/22/2022 Final**
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
1.1 ESCALATION CALCULATION

PHASE 5

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to
Total escalation **32.63%** to Summary

EXTERIOR IMPROVEMENTS

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to
Total escalation **32.63%** to Summary

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST **Date: 07/22/2022 Final**
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
1.1 ESCALATION CALCULATION

WINDING MOTORS

Date of Estimate Pricing	7/1/2022	
Start construction	10/1/2025	
End construction	10/1/2030	
Duration, days	1826	Days
Duration, months	61	Months
Date of estimate pricing to start	1188	Days
To Mid-point of construction period	2101	days
	70	months
Mid-point of construction	4/1/2028	

Annual escalation rate is estimated at 8% till 12/31/2023, and 4% thereafter to
Total escalation **32.63%** to Summary

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
2.0 KEY QUANTITIES **Date: 07/22/2022 Final**

Program Areas

						Exterior
1.1	**Phase 1A 12KV Switchgear Upgrade**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
1.2	Total	846				
1.3	Level 1		846	15	616	9,240

						Exterior
2.1	**Phase 1B: Bridge Crane Upgrade**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
2.2	Total	4,434				
2.3	Level 1 Mezzanine		2,539	15	616	9,240
2.4	Level 1		1,895	15	616	9,240

3.1	**Phase 2: Office Improvements**	**SF**	**Footprint**	**Fl-Fl**		
3.2	Total	10,471				
3.3	Level 2 Mezzanine		5,603	15	616	9,240
3.4	Level 2		962	15	616	9,240
3.5	Level 1 Mezzanine		579	15	616	9,240
3.6	Level 1		3,327	15	616	9,240

						Exterior
4.1	**Phase 3A: Program Restructuring**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
4.2	Total	7,766				
4.3	Level 2		700	15	616	9,240
4.4	Level 1 Mezzanine		1,462	15	616	9,240
4.5	Level 1		5,604	15	616	9,240

						Exterior
5.1	**Phase 3B: Carpentry Improvements**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
5.2	Total	3,440				
5.3	Level 2		3,440	15	616	9,240

						Exterior
6.1	**Phase 4: Roof Replacement**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
6.2	Total	33,770				
6.3	Roof		33,770	15	616	9,240

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
2.0 KEY QUANTITIES **Date: 07/22/2022 Final**

						Exterior
7.1	**Phase 5: Seismic Improvements**	**SF**	**Footprint**	**Fl-Fl**	**Perimeter**	**Enclosure**
7.2	Total	20,700				
7.3	5.2.1		700	15	616	9,240
7.4	5.2.2		5,000	15	616	9,240
7.5	5.2.3		5,000	15	616	9,240
7.6	5.2.4		5,000	15	616	9,240
7.7	5.2.5		5,000	15	616	9,240

8.1	**Exterior Improvements**	**SF**
8.2	Brick masonry exterior wall	15,579
8.3	Exterior windows	3,350
8.4	Exterior clerestory windows	510

9.1	**Winding Motors**	**SF**
	Winding motors	600

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.0 BASE CONSTRUCTION COST ESTIMATE SUMMARY

Date: 07/22/2022 Final

		CONCURRENT		PHASED			CONCURRENT	PHASED
	ELEMENT / LOCATION	BASE CONSTRUCTION COST	CONSTRUCTION COST, ESCALATED TO MID POINT $	BASE CONSTRUCTION COST	CONSTRUCTION COST, ESCALATED TO MID POINT $	GSF	$/GSF Escalated to Midpt	$/GSF Escalated to Midpt
				Phasing Premium	Phasing Premium			
	ESTIMATE SUMMARY:			10%	10%			
1	3.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE	$5,197,046	$6,893,049	$5,716,750	$7,582,354	846	$8,148	$8,963
2	3.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE	$5,958,724	$7,903,292	$6,554,596	$8,693,621	4,434	$1,782	$1,961
3	3.3 PHASE 2: OFFICE IMPROVEMENTS	$14,945,861	$19,823,289	$16,440,447	$21,805,618	10,471	$1,893	$2,082
4	3.4 PHASE 3A: PROGRAMMING RESTRUCTURING	$7,341,126	$9,736,827	$8,075,238	$10,710,509	7,766	$1,254	$1,379
5	3.5 PHASE 3B: CARPENTRY UPGRADES	$4,737,994	$6,284,190	$5,211,793	$6,912,609	3,440	$1,827	$2,009
7	3.6 PHASE 4: ROOF REPLACEMENT	$7,803,323	$10,349,857	$8,583,655	$11,384,842	33,770	$306	$337
8	3.7 PHASE 5: SEISMIC IMPROVEMENTS	$12,136,957	$13,429,514	$13,350,653	$14,772,466	20,700	$649	$714
9	3.8 EXTERIOR IMPROVEMENTS	$8,435,058	$11,187,753	$9,278,564	$12,306,529	15,579	$718	$790
10	3.9 WINDING MOTORS	$3,200,050	$4,244,354	$3,520,056	$4,668,790	600	$7,074	$7,781
1-10	**TOTAL ESTIMATED BASE CONSTRUCTION COST**	$69,756,139	$89,852,125	$76,731,752	$98,837,338			
	TOTAL ESTIMATED BASE CONSTRUCTION COST	**$69,756,000**	**$89,852,000**	**$76,732,000**	**$98,837,000**			

Notes:
1) Excludes softcost
2) Excludes O&M costs
3) For a complete scope of the estimate including assumptions & qualifications, it is important to read the attached "Basis of Estimate" and "Estimate Details"
4) Note that both concurrent and phased construction options are currently assuming the same construction schedule. This should be confirmed and verified.

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE

Date: 07/22/2022 Final
846 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	TRADE DEMOLITION		13,590	16.06	0.20	
	SUBSTRUCTURE		13,590	16.06	0.20	
C10	**INTERIOR CONSTRUCTION**					
C1010	PARTITIONS		55,205	65.25	0.80	
C1020	INTERIOR DOORS		40,500	47.87	0.59	
	INTERIOR CONSTRUCTION		95,705	113.13	1.39	
C30	**INTERIOR FINISHES**					
C3010	WALL FINISHES		10,007	11.83	0.15	
C3020	FLOOR FINISHES		8,460	10.00	0.12	
C3030	CEILING FINISHES		21,150	25.00	0.31	
	INTERIOR FINISHES		39,617	46.83	0.57	
D15	**MECHANICAL**					
D1520	PLUMBING		8,272	9.78	0.12	
D1530	HVAC			0.00	0.00	
D1540	FIRE PROTECTION		293,800	347.28	4.26	
	MECHANICAL		302,072	357.06	4.38	
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		2,342,725	2769.18	33.99	
D5030	COMMUNICATION & SECURITY		20,304	24.00	0.29	
	ELECTRICAL		2,363,029	2793.18	34.28	
	TOTAL DIRECT COSTS		2,814,013	3326.26	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	562,803	665.25	8.16	
	MARKET FACTOR	5.0%	168,841	199.58	2.45	
	OVERHEAD AND PROFIT	10.0%	354,566	419.11	5.14	
	BONDING AND INSURANCE	2.5%	97,506	115.25	1.41	
	DESIGN CONTINGENCY	30.0%	1,199,318	1417.63	17.40	
	BASE CONSTRUCTION COST (Unescalated)		5,197,046	6143.08	75.40	
	ESCALATION - PHASE 1	32.6%	1,696,003	2004.73	24.60	
	BASE CONSTRUCTION COST (Escalated)		6,893,049	8147.81	100.00	
	CONSTRUCTION COST (Escalated)		**6,893,049**	**8147.81**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE

Date: 07/22/2022 Final
4,434 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	FOUNDATIONS		201,390	45.42	2.55	
	SUBSTRUCTURE		201,390	45.42	2.55	
B10	**SUPERSTRUCTURE**					
B1010	FLOOR CONSTRUCTION		1,383,158	311.94	17.50	
	SUPERSTRUCTURE		1,383,158	311.94	17.50	
C10	**INTERIOR CONSTRUCTION**					
C1010	PARTITIONS		218,518	49.28	2.76	
C1020	INTERIOR DOORS		71,750	16.18	0.91	
C1030	SPECIALTIES		102,476	23.11	1.30	
	INTERIOR CONSTRUCTION		392,744	88.58	4.97	
C30	**INTERIOR FINISHES**					
C3010	WALL FINISHES		34,241	7.72	0.43	
C3020	FLOOR FINISHES		38,085	8.59	0.48	
C3030	CEILING FINISHES		50,780	11.45	0.64	
	INTERIOR FINISHES		123,106	27.76	1.56	
D15	**MECHANICAL**					
D1530	HVAC		295,615	66.67	3.74	
D1540	FIRE PROTECTION		53,208	12.00	0.67	
	MECHANICAL		348,823	78.67	4.41	
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		229,000	51.65	2.90	
D5020	LIGHTING & BRANCH WIRING		133,020	30.00	1.68	
D5030	COMMUNICATION & SECURITY		106,416	24.00	1.35	
D5040	AUDIO VISUAL SYSTEM		22,170	5.00	0.28	
	ELECTRICAL		490,606	110.65	6.21	
E10	**EQUIPMENT**					
E1059	OTHER EQUIPMENT		275,390	62.11	3.48	
	EQUIPMENT		275,390	62.11	3.48	
E20	**FURNISHINGS**					
E2010	CASEWORK		11,217	2.53	0.14	
	FURNISHINGS		11,217	2.53	0.14	
	TOTAL DIRECT COSTS		3,226,434	727.66	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	645,287	145.53	8.16	
	MARKET FACTOR	5.0%	193,586	43.66	2.45	
	OVERHEAD AND PROFIT	10.0%	406,531	91.68	5.14	
	BONDING AND INSURANCE	2.5%	111,796	25.21	1.41	
	DESIGN CONTINGENCY	30.0%	1,375,090	310.12	17.40	
	BASE CONSTRUCTION COST (Unescalated)		5,958,724	1343.87	75.40	
	ESCALATION - PHASE 1	32.6%	1,944,568	438.56	24.60	
	BASE CONSTRUCTION COST (Escalated)		7,903,292	1782.43	100.00	
	CONSTRUCTION COST (Escalated)		**7,903,292**	**1782.43**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.3 PHASE 2: OFFICE IMPROVEMENTS

Date: 07/22/2022 Final
10,471 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	TRADE DEMOLITION		157,065	15.00	0.79	
	SUBSTRUCTURE		157,065	15.00	0.79	
B10	**SUPERSTRUCTURE**					
B1010	FLOOR CONSTRUCTION		193,800	18.51	0.98	
	SUPERSTRUCTURE		193,800	18.51	0.98	
C10	**INTERIOR CONSTRUCTION**					
C1010	PARTITIONS		1,340,143	127.99	6.76	
C1020	INTERIOR DOORS		259,750	24.81	1.31	
C1030	SPECIALTIES		325,931	31.13	1.64	
	INTERIOR CONSTRUCTION		1,925,824	183.92	9.71	
C30	**INTERIOR FINISHES**					
C3010	WALL FINISHES		137,074	13.09	0.69	
C3020	FLOOR FINISHES		157,065	15.00	0.79	
C3030	CEILING FINISHES		209,420	20.00	1.06	
	INTERIOR FINISHES		503,559	48.09	2.54	
D10	**CONVEYING SYSTEMS**					
D1010	ELEVATORS & LIFTS		315,000	30.08	1.59	
	CONVEYING SYSTEMS		315,000	30.08	1.59	
D15	**MECHANICAL**					
D1520	PLUMBING		1,773,689	169.39	8.95	
D1530	HVAC		1,155,266	110.33	5.83	
D1540	FIRE PROTECTION		271,552	25.93	1.37	
	MECHANICAL		3,200,507	305.65	16.15	
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		762,845	72.85	3.85	
D5020	LIGHTING & BRANCH WIRING		366,485	35.00	1.85	
D5030	COMMUNICATION & SECURITY		439,782	42.00	2.22	
D5040	AUDIO VISUAL SYSTEM		52,355	5.00	0.26	
	ELECTRICAL		1,621,467	154.85	8.18	
E10	**EQUIPMENT**					
E1059	OTHER EQUIPMENT		118,210	11.29	0.60	
	EQUIPMENT		118,210	11.29	0.60	
E20	**FURNISHINGS**					
E2010	CASEWORK		57,213	5.46	0.29	
	FURNISHINGS		57,213	5.46	0.29	
	TOTAL DIRECT COSTS		8,092,645	772.86	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	1,618,529	154.57	8.16	
	MARKET FACTOR	5.0%	485,559	46.37	2.45	
	OVERHEAD AND PROFIT	10.0%	1,019,673	97.38	5.14	
	BONDING AND INSURANCE	2.5%	280,410	26.78	1.41	
	DESIGN CONTINGENCY	30.0%	3,449,045	329.39	17.40	
	BASE CONSTRUCTION COST (Unescalated)		14,945,861	1427.36	75.40	
	ESCALATION - PHASE 2	32.6%	4,877,428	465.80	24.60	
	BASE CONSTRUCTION COST (Escalated)		19,823,289	1893.16	100.00	
	CONSTRUCTION COST (Escalated)		**19,823,289**	**1893.16**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.4 PHASE 3A: PROGRAMMING RESTRUCTURING

Date: 07/22/2022 Final
7,766 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	DEMOLITION		101,488	13.07	1.04	
	SUBSTRUCTURE		101,488	13.07	1.04	
C10	**INTERIOR CONSTRUCTION**					
C1010	PARTITIONS		111,935	14.41	1.15	
C1020	INTERIOR DOORS		62,100	8.00	0.64	
C1030	SPECIALTIES		40,596	5.23	0.42	
	INTERIOR CONSTRUCTION		214,631	27.64	2.20	
C30	**INTERIOR FINISHES**					
C3010	WALL FINISHES		21,308	2.74	0.22	
C3020	FLOOR FINISHES		116,490	15.00	1.20	
C3030	CEILING FINISHES		155,320	20.00	1.60	
	INTERIOR FINISHES		293,118	37.74	3.01	
D15	**MECHANICAL**					
D1520	PLUMBING		757,390	97.53	7.78	
D1530	HVAC		847,659	109.15	8.71	
D1540	FIRE PROTECTION		93,192	12.00	0.96	
	MECHANICAL		1,698,241	218.68	17.44	
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		907,936	116.91	9.32	
D5020	LIGHTING & BRANCH WIRING		232,980	30.00	2.39	
D5030	COMMUNICATION & SECURITY		186,384	24.00	1.91	
D5040	AUDIO VISUAL SYSTEM		38,830	5.00	0.40	
	ELECTRICAL		1,366,130	175.91	14.03	
E10	**EQUIPMENT**					
E1059	OTHER EQUIPMENT		263,190	33.89	2.70	
	EQUIPMENT		263,190	33.89	2.70	
E20	**FURNISHINGS**					
E2010	CASEWORK		38,157	4.91	0.39	
	FURNISHINGS		38,157	4.91	0.39	
	TOTAL DIRECT COSTS		3,974,955	511.84	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	794,991	102.37	8.16	
	MARKET FACTOR	5.0%	238,497	30.71	2.45	
	OVERHEAD AND PROFIT	10.0%	500,844	64.49	5.14	
	BONDING AND INSURANCE	2.5%	137,732	17.74	1.41	
	DESIGN CONTINGENCY	30.0%	1,694,106	218.14	17.40	
	BASE CONSTRUCTION COST (Unescalated)		7,341,126	945.29	75.40	
	ESCALATION - PHASE 3	32.6%	2,395,701	308.49	24.60	
	BASE CONSTRUCTION COST (Escalated)		9,736,827	1253.78	100.00	
	CONSTRUCTION COST (Escalated)		**9,736,827**	**1253.78**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.5 PHASE 3B: CARPENTRY UPGRADES

Date: 07/22/2022 Final
3,440 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	DEMOLITION		43,000	12.50	0.68	
	SUBSTRUCTURE		43,000	12.50	0.68	
C10	**INTERIOR CONSTRUCTION**					
C1010	PARTITIONS		113,935	33.12	1.81	
C1020	INTERIOR DOORS		32,450	9.43	0.52	
C1030	SPECIALTIES		137,200	39.88	2.18	
	INTERIOR CONSTRUCTION		283,585	82.44	4.51	
C30	**INTERIOR FINISHES**					
C3010	WALL FINISHES		21,840	6.35	0.35	
C3020	FLOOR FINISHES		51,600	15.00	0.82	
C3030	CEILING FINISHES		68,800	20.00	1.09	
	INTERIOR FINISHES		142,240	41.35	2.26	
D15	**MECHANICAL**					
D1520	PLUMBING		327,969	95.34	5.22	
D1530	HVAC		529,726	153.99	8.43	
D1540	FIRE PROTECTION		61,920	18.00	0.99	
	MECHANICAL		919,615	267.33	14.63	
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		702,006	204.07	11.17	
D5020	LIGHTING & BRANCH WIRING		103,200	30.00	1.64	
D5030	COMMUNICATION & SECURITY		82,560	24.00	1.31	
D5040	AUDIO VISUAL SYSTEM		17,200	5.00	0.27	
	ELECTRICAL		904,966	263.07	14.40	
E10	**EQUIPMENT**					
E1059	OTHER EQUIPMENT		261,727	76.08	4.16	
	EQUIPMENT		261,727	76.08	4.16	
E20	**FURNISHINGS**					
E2010	CASEWORK		10,320	3.00	0.16	
	FURNISHINGS		10,320	3.00	0.16	
	TOTAL DIRECT COSTS		2,565,453	745.77	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	513,091	149.15	8.16	
	MARKET FACTOR	5.0%	153,927	44.75	2.45	
	OVERHEAD AND PROFIT	10.0%	323,247	93.97	5.14	
	BONDING AND INSURANCE	2.5%	88,893	25.84	1.41	
	DESIGN CONTINGENCY	30.0%	1,093,383	317.84	17.40	
	BASE CONSTRUCTION COST (Unescalated)		4,737,994	1377.32	75.40	
	ESCALATION - SEE GRAND SUMMARY	32.6%	1,546,196	449.48	24.60	
	BASE CONSTRUCTION COST (Escalated)		6,284,190	1826.80	100.00	
	CONSTRUCTION COST (Escalated)		**6,284,190**	**1826.80**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.6 PHASE 4: ROOF REPLACEMENT **Date: 07/22/2022 Final**
33,770 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
A10	**SUBSTRUCTURE**					
A1010	TRADE DEMOLITION		296,610	8.78	2.87	
	SUBSTRUCTURE		296,610	8.78	2.87	
				0.00	0.00	0.00
B10	**SUPERSTRUCTURE**					
B1020	ROOF CONSTRUCTION		1,334,745	39.52	12.90	
	SUPERSTRUCTURE		1,334,745	39.52	12.90	
B30	**ROOFING**					
B3010	ROOF COVERINGS		2,313,558	68.51	22.35	
B3020	ROOF OPENINGS		132,000	3.91	1.28	
	ROOFING		2,445,558	72.42	23.63	
D15	**MECHANICAL**					
D1520	PLUMBING		148,305	4.39	1.43	
	MECHANICAL		148,305	4.39	1.43	
	TOTAL DIRECT COSTS		4,225,218	125.12	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	845,044	25.02	8.16	
	MARKET FACTOR	5.0%	253,513	7.51	2.45	
	OVERHEAD AND PROFIT	10.0%	532,377	15.76	5.14	
	BONDING AND INSURANCE	2.5%	146,404	4.34	1.41	
	DESIGN CONTINGENCY	30.0%	1,800,767	53.32	17.40	
	BASE CONSTRUCTION COST (Unescalated)		7,803,323	231.07	75.40	
	ESCALATION - PHASE 4	32.6%	2,546,534	75.41	24.60	
	BASE CONSTRUCTION COST (Escalated)		**10,349,857**	**306.48**	**100.00**	
	CONSTRUCTION COST (Escalated)		**10,349,857**	**306.48**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.7 PHASE 5: SEISMIC IMPROVEMENTS

Date: 07/22/2022 Final
20,700 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
5.2.1	**CHIMNEY SEPERATION**					
	DIRECT COST		354,500	17.13		
	TOTAL COST W/MARKUPS		654,707	31.63		
	TOTAL COST W/ESCALATION		724,431	35.00		
	CHIMNEY SEPERATION		724,431	35.00		
5.2.2A	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET SHOTCRETE/DOWELS**					Option A: For South/East Walls
	DIRECT COST		1,955,225	94.46		
	TOTAL COST W/MARKUPS		3,610,998	174.44		
	TOTAL COST W/ESCALATION		3,995,560	193.02		
	SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET		3,995,560	193.02		
5.2.3	**CONCRETE MASONRY UNIT WALL AT GRID LINE G**					
	DIRECT COST		1,695,000	81.88		
	TOTAL COST W/MARKUPS		3,130,402	151.23		
	TOTAL COST W/ESCALATION		3,463,783	167.33		
	CONCRETE MASONRY UNIT WALL AT GRID LINE G		3,463,783	167.33		
5.2.4	**ADDING NEW SEISMIC FORCE AT GRID LINES E**					
	DIRECT COST		1,152,500	55.68		
	TOTAL COST W/MARKUPS		2,128,489	102.83		
	TOTAL COST W/ESCALATION		2,355,168	113.78		
	ADDING NEW SEISMIC FORCE AT GRID LINES E		2,355,168	113.78		
5.2.5	**MAIN ROOF DIAPHRAGM**					
	DIRECT COST		1,012,000	48.89		
	TOTAL COST W/MARKUPS		1,869,007	90.29		
	TOTAL COST W/ESCALATION		2,068,052	99.91		
	MAIN ROOF DIAPHRAGM		2,068,052	99.91		
5.2.6	**OTHER ADDED ELEMENTS FOR SEISIMC FORCE**					
	DIRECT COST		402,500	19.44		
	TOTAL COST W/MARKUPS		743,355	35.91		
	TOTAL COST W/ESCALATION		822,521	39.74		
	OTHER ADDED ELEMENTS FOR SEISIMC FORCE		822,521	39.74		
	TOTAL COSTS w/Option A and w/ Escalation		13,429,514	648.77		Cost Excludes Option B: Fibre Wrap

Alternate Cost Option

5.2.2B	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET FIBRE WRAP**					Option B: Alternate cost to Shotcrete/Dowels
	DIRECT COST		3,540,800	171.05		
	TOTAL COST W/MARKUPS		6,539,309	315.91		
	TOTAL COST W/ESCALATION		7,235,730	349.55		
	SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET		7,235,730	349.55		

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.8 EXTERIOR IMPROVEMENTS **Date: 07/22/2022 Final**
15,579 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
	ESTIMATE SUMMARY:					
B20	**EXTERIOR CLOSURE**					
B2010	EXTERIOR WALLS		1,988,280	127.63	17.77	
B2020	EXTERIOR WINDOWS		1,274,500	81.81	11.39	
B2030	EXTERIOR DOORS		250,000	16.05	2.23	
	EXTERIOR CLOSURE		3,512,780	225.48	31.40	
B30	**ROOFING**					
B3010	ROOF COVERINGS			0.00	0.00	
B3020	ROOF OPENINGS		1,054,500	67.69	9.43	
	ROOFING		1,054,500	67.69	9.43	
	TOTAL DIRECT COSTS		4,567,280	293.17	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	913,456	58.63	8.16	
	MARKET FACTOR	5.0%	274,037	17.59	2.45	
	OVERHEAD AND PROFIT	10.0%	575,477	36.94	5.14	
	BONDING AND INSURANCE	2.5%	158,256	10.16	1.41	
	DESIGN CONTINGENCY	30.0%	1,946,552	124.95	17.40	
	BASE CONSTRUCTION COST (Unescalated)		8,435,058	541.44	75.40	
	ESCALATION - PHASE 1	32.6%	2,752,695	176.69	24.60	
	BASE CONSTRUCTION COST (Escalated)		11,187,753	718.13	100.00	
	CONSTRUCTION COST (Escalated)		**11,187,753**	**718.13**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
3.9 WINDING MOTORS **Date: 07/22/2022 Final**
846 GSF

Ref.	Section		Total Cost	$/GSF	%	Comments
D50	**ELECTRICAL**					
D5010	ELECTRICAL DISTRIBUTION		1,732,712	2048.12	40.82	
D5030	COMMUNICATION & SECURITY			0.00	0.00	
	ELECTRICAL		1,732,712	2048.12	40.82	
	TOTAL DIRECT COSTS		1,732,712	2048.12	40.82	
	ADD MARKUPS (CUMULATIVE)					
	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	346,542	409.62	8.16	
	MARKET FACTOR	5.0%	103,963	122.89	2.45	
	OVERHEAD AND PROFIT	10.0%	218,322	258.06	5.14	
	BONDING AND INSURANCE	2.5%	60,038	70.97	1.41	
	DESIGN CONTINGENCY	30.0%	738,473	872.90	17.40	
	BASE CONSTRUCTION COST (Unescalated)		3,200,050	3782.57	75.40	
	ESCALATION - PHASE 1	32.6%	1,044,304	1234.40	24.60	
	BASE CONSTRUCTION COST (Escalated)		4,244,354	5016.97	100.00	
	CONSTRUCTION COST (Escalated)		**4,244,354**	**5016.97**	**100.00**	

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE **Date: 07/22/2022 Final**

Floor Area: **846 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
A1010	1	**TRADE DEMOLITION**				
	2					
	3	Remove existing metal shelving	20	LF	45.00	900
	4	Clear area as required for new work - allow	846	SF	15.00	12,690
	5					
	6	**TRADE DEMOLITION**				13,590
	7					
	92					
C1010	93	**PARTITIONS**				
	94					
	95	New fire-rated metal stud partition framing	915	SF	25.00	22,875
	96	Insulation at new interior partition	915	SF	5.00	4,575
	97	Gypsum board partition sheathing, taped and sanded	1,830	SF	7.50	13,725
	98	Gypsum board underlayment	1,830	SF	7.00	12,810
	99	Acoustic sealant	244	LF	5.00	1,220
	100					
	101	**PARTITIONS**				55,205
	102					
	103					
C1020	104	**INTERIOR DOORS**				
	106	Hollow metal door in hollow metal frame with hardware, 90-minute fire rated, 6'-6" x 7'-0" pair	2	PR	8,000.00	16,000
	107	Overhead coiling door, 90-minute fire rated, 16'-0" x 9'-0"	1	EA	18,000.00	18,000
	108	Specialty hardware (panic, etc.) - allow	1	LS	2,500.00	2,500
	109	Card readers, etc. - allow	1	EA	4,000.00	4,000
	110					
	111	**INTERIOR DOORS**				40,500
	112					
	119					
C3010	120	**WALL FINISHES**				
	121	Paint to walls	2,859	SF	3.50	10,007
	122					
	123	**WALL FINISHES**				10,007
	124					
	125					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE **Date: 07/22/2022 Final**

Floor Area: **846 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
C3020	126	**FLOOR FINISHES**				
	127	Sealer to existing concrete flooring	846	SF	10.00	8,460
	128					
	129	**FLOOR FINISHES**				8,460
	130					
	131					
C3030	132	**CEILING FINISHES**				
	133	New fire-rated gypsum board ceiling, painted	846	SF	25.00	21,150
	134					
	135					
	136	**CEILING FINISHES**				21,150
	137					
	138					
D1010	139	**ELEVATORS & LIFTS**				
	140					
	141	See Phase 2				
	142					
	143	**ELEVATORS & LIFTS**				
	144					
	145					
D1520	158	**PLUMBING**				
	159					
	160	Industrial Fixtures				
	161	Eyewash, complete with in-line tepid water heater	1	EA	6,600.00	6,600
	162					
	163	Testing and sterilization				
	164	Testing and sterilization	2	HR	205.00	410
	165					
	166	Miscellaneous Plumbing				
	167	Project requirements, project management, detailing, coordination, etc	1	LS	1,261.80	1,262
	168					
	169	**PLUMBING**				8,272
	170					
	171					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE **Date: 07/22/2022 Final**

Floor Area: **846 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D1540	178	**FIRE PROTECTION**				
	179					
	180	FM200 and control panel	846	SF	300.00	253,800
	181	Preaction double interlock system	1	LS	40,000.00	40,000
	182					
	183	**FIRE PROTECTION**				293,800
	184					
	185					
D5010	186	**ELECTRICAL DISTRIBUTION**				
	187					
	188	Main normal power				
	189	PG&E Metering				By PG&E
	190	12KV Vault	2	EA	18,000.00	36,000
	191	12KV-480V Electrical substation, 2,500KVA				
		Quote Leadtime, 8-10 week drawings/Shipment 54-60 weeks	1	LS	1,374,760.00	1,374,760
		Sales tax	8.63%	%	1,374,760.00	118,573
		Markups	15.00%	%	118,573.00	17,786
		Installation	160	HR	205.00	32,800
	197	12KV Feeders	100	LF	1,500.00	150,000
	198	Power monitoring	1	LS	25,000.00	25,000
	199	Grounding	846	SF	0.50	423
	200					
	201	Machine and equipment power				
	202	Winding Motors				AC/DC Later phase
	203	Isolation transformers				AC/DC Later phase
	204	Miscellaneous power connections	846	SF	1.50	1,269
	205					
	206	User convenience power				
	207	Receptacles				Existing
	208					
	209	Trade demolition				
	210	Remove existing electrical substation	960	HR	205.00	196,800
	211	Temporary power	1	WK	15,000.00	15,000
	212					
	213	Miscellaneous electrical				
	214	Arc Flash Study	1	LS	20,000.00	20,000

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.1 PHASE 1A: 12KV SWITCHGEAR UPGRADE **Date: 07/22/2022 Final**

Floor Area: **846 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	215	Project requirements, project management, detailing, coordination, etc	1	LS	354,313.98	354,314
	216					
	217	**ELECTRICAL DISTRIBUTION**				2,342,725
	218					
	219					
D5020	220	**LIGHTING & BRANCH WIRING**				
	221					
	222	Lighting				Existing
	223					
	224	**LIGHTING & BRANCH WIRING**				
	225					
	226					
D5030	227	**COMMUNICATION & SECURITY**				
	228					
	229	Telecommunications, including CAT6A cabling, conduit and outlets and WAPs				Not Required
	230	Fire alarm system, including new fire alarm panel and annunciator, fire alarm devices, conduit and cable	846	SF	18.00	15,228
	231	Security system, including access control, video surveillance monitoring, conduit and cable	846	SF	6.00	5,076
	232					
	233	**COMMUNICATION & SECURITY**				20,304
	234					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
A1010	1	**TRADE DEMOLITION**				
	2					
	3	Decommission existing 10-ton crane	1	LS	150,000.00	150,000
	4	Remove existing Stair #6 in its entirety	1	LS	7,500.00	7,500
	5	Miscellaneous selective demolition for new crane - allow	2,494	SF	10.00	24,940
	6	Miscellaneous selective demolition for new office addition - allow	1,895	SF	10.00	18,950
	7					
	8	**TRADE DEMOLITION**				201,390
	9					
	34					
B1010	35	**FLOOR CONSTRUCTION**				
	36					
	37	Bridge crane support min including new 8" x 18" pilasters - allow	75	TN	10,000.00	750,000
	38	Structural steel at 1M for Office Addition - allow 20#/SF	25	TN	10,000.00	250,000
	39	Metal deck at 1M Office Addition	2,539	SF	15.00	38,085
	40	Reinforced concrete fill at metal deck	2,539	SF	12.50	31,738
	41	Connection to existing structure - allow	238	LF	350.00	83,300
	42	New metal stair with associated guardrail and handrails (Stair #6)	1	FLT	65,000.00	65,000
	43					
	44	Miscellaneous				
	45	Intumescent fire proofing paint to steel - allow	2,539	SF	50.00	126,950
	46	Miscellaneous metals and rough carpentry - a	2,539	SF	15.00	38,085
	47					
	48	**FLOOR CONSTRUCTION**				1,383,158
	49					
	86					
C1010	87	**PARTITIONS**				
	88					
	89	New metal stud partition framing	3,167	SF	22.50	71,258
	90	Insulation at new interior partition	3,167	SF	5.00	15,835
	91	Gypsum board partition sheathing, taped and sanded	6,334	SF	7.50	47,505
	92	Patch and repair existing wall surrounding build-out - allow	2,300	SF	2.50	5,750

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	93	Acoustic sealant	844	LF	5.00	4,220
	94	Interior glazing	493	SF	150.00	73,950
	95					
	96	**PARTITIONS**				218,518
	97					
	98					
C1020	99	**INTERIOR DOORS**				
	100					
	101	Hollow metal door in hollow metal frame with hardware, 3'-0" x 7'-0" single	6	EA	3,500.00	21,000
	102	Hollow metal door in hollow metal frame with hardware and half glass, 3'-0" x 7'-0" single	1	EA	4,250.00	4,250
	103	Aluminum glazed entry door, 3'-0" x 7'-1-1/4" single	3	EA	5,500.00	16,500
	104	Specialty hardware (panic, etc.) - allow	1	LS	15,000.00	15,000
	105	Card readers, etc. - allow	1	EA	15,000.00	15,000
	106					
	107	**INTERIOR DOORS**				71,750
	108					
	109					
C1030	110	**SPECIALTIES**				
	111					
	112	Interior code related signage - allow	1,895	SF	2.50	4,738
	113	Metal guardrail at new walkway	124	LF	750.00	93,000
	114	Miscellaneous interior fittings - allow	1,895	SF	2.50	4,738
	115					
	116	**SPECIALTIES**				102,476
	117					
	118					
C3010	119	**WALL FINISHES**				
	120					
	121	Paint to walls	9,783	SF	3.50	34,241
	122					
	123	**WALL FINISHES**				34,241
	124					
	125					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
C3020	126	**FLOOR FINISHES**				
	127					
	128	New flooring and base at build-out - allow	2,539	SF	15.00	38,085
	129					
	130	**FLOOR FINISHES**				38,085
	131					
	132					
C3030	133	**CEILING FINISHES**				
	134					
	135	New ceiling finish at build-out - allow	2,539	SF	20.00	50,780
	136					
	137	**CEILING FINISHES**				50,780
	138					
	145					
D1520	146	**PLUMBING**				
	147					
	148	Not Required				
	149					
	150	**PLUMBING**				
	151					
	152					
D1530	153	**HVAC**				
	154					
	155	Air handling units				
	156	Recirculation fans	4,434	SF	8.00	35,472
	157					
	158	Passive system				
	159	Electric radiant heaters	4,434	SF	12.00	53,208
	160	Electric wall radiators	4,434	SF	14.00	62,076
	161					
	162	Controls and instrumentation				
	163	DDC controls	4,434	SF	12.00	53,208
	164					
	165	Testing and balancing				
	166	Testing and balancing	4,434	SF	3.00	13,302
	167	Commissioning assistance	4,434	SF	1.50	6,651
	168					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	169	Unit Ventilation				
	170	Exhaust fans	4,434	SF	6.00	26,604
	171					
	172	Miscellaneous HVAC				
	173	Project requirements, project management, detailing, coordination, etc.	1	LS	45,093.78	45,094
	174					
	175	**HVAC**				295,615
	176					
	177					
D1540	178	**FIRE PROTECTION**				
	179					
	180	Automatic wet sprinkler system - modify and reuse existing	4,434	SF	12.00	53,208
	181					
	182	**FIRE PROTECTION**				53,208
	183					
	184					
D5010	185	**ELECTRICAL DISTRIBUTION**				
	186					
	187	Main normal power				
	188	480V Distribution switchboard, 800A	1	LS	68,000.00	68,000
	189	Feeder conduit and wire	300	LF	180.00	54,000
	190	Power monitoring	1	LS	20,000.00	20,000
	191	Grounding	4,434	SF	0.50	2,217
	192					
	193	Machine and equipment power				
	194	Bridge crane 20 tons	2	EA	10,000.00	20,000
	195	Miscellaneous power connections	4,434	SF	1.50	6,651
	196					
	197	User convenience power				
	198	Receptacles				Existing
	199					
	200	Trade demolition				
	201	Demo existing	40	HR	205.00	8,200
	202	Temporary power	1	WK	15,000.00	15,000
	203					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	204	Miscellaneous electrical				
	205	Project requirements, project management, detailing, coordination, etc.	1	LS	34,932.24	34,932
	206					
	207	**ELECTRICAL DISTRIBUTION**				229,000
	208					
	209					
D5020	210	**LIGHTING & BRANCH WIRING**				
	211					
	212	New lighting and lighting controls	4,434	SF	30.00	133,020
	213					
	214	**LIGHTING & BRANCH WIRING**				133,020
	215					
	216					
D5030	217	**COMMUNICATION & SECURITY**				
	218					
	219	Telecommunications, including CAT6A cabling, conduit and outlets and WAPs				Not Required
	220	Fire alarm system, including new fire alarm panel and annunciator, fire alarm devices, conduit and cable	4,434	SF	18.00	79,812
	221	Security system, including access control, video surveillance monitoring, conduit and cable	4,434	SF	6.00	26,604
	222					
	223	**COMMUNICATION & SECURITY**				106,416
	224					
	225					
D5040	226	**AUDIO VISUAL SYSTEM**				
	227					
	228	A/V conduit only	4,434	SF	5.00	22,170
	229					
	230	**AUDIO VISUAL SYSTEM**				22,170
	231					
E10	232	**OTHER EQUIPMENT**				
	233					
	234	New 20-ton crane - allow	1	EA	250,000.00	250,000

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.2 PHASE 1B: 20TON BRIDGE CRANE UPGRADE **Date: 07/22/2022 Final**

Floor Area: **4,434 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	235	Miscellaneous equipment at Office Addition (AV, etc.)	2,539	SF	10.00	25,390
	236					
	237	**OTHER EQUIPMENT**				275,390
	238					
	239					
E20	240	**CASEWORK**				
	241					
	242	Built-in casework at 1M58	6	LF	600.00	3,600
	243	Miscellaneous fixed furnishings - allow	2,539	SF	3.00	7,617
	244					
	245	**CASEWORK**				11,217

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.3 PHASE 2: OFFICE IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
A1010	1	**TRADE DEMOLITION**				
	2					
	3	Demolition as required - allow	10,471	SF	15.00	157,065
	4					
	5	**TRADE DEMOLITION**				157,065
	6					
	31					
B1010	32	**FLOOR CONSTRUCTION**				
	33					
	34	Structural upgrade at elevators - allow	1	LS	150,000.00	150,000
	35	Structural upgrade at new restroom - allow for new beam and concrete on metal deck	146	SF	300.00	43,800
	36					
	37	**FLOOR CONSTRUCTION**				193,800
	38					
	75					
C1010	76	**PARTITIONS**				
	77					
	78	New metal stud partition framing	16,497	SF	22.50	371,183
	79	Insulation at new interior partition	16,497	SF	5.00	82,485
	80	Gypsum board partition sheathing, taped and sanded	32,994	SF	7.50	247,455
	81	Patch and repair existing interior partitions and wall surrounding build-out - allow	6,170	SF	2.50	15,425
	82	Wall infill at opening	132	SF	75.00	9,900
	83	Acoustic sealant	4,399	LF	5.00	21,995
	84	Interior glazing	854	SF	150.00	128,100
	85	Tempered glass wall installed behind existing guardrail - allow to 10' tall	2,300	SF	200.00	460,000
	86	Wire mesh partition at Bicycle Storage	24	LF	150.00	3,600
	87					
	88	**PARTITIONS**				1,340,143
	89					
	90					
C1020	91	**INTERIOR DOORS**				
	92					
	94	Hollow metal door in hollow metal frame with hardware, 3'-0" x 7'-0" single	35	EA	3,500.00	122,500

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.3 PHASE 2: OFFICE IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	95	Hollow metal door in hollow metal frame with hardware and half glass, 3'-0" x 7'-0" single	2	EA	4,250.00	8,500
	96	Aluminum glazed entry door, 6'-0" x 7'-2" pair	1	PR	10,500.00	10,500
	97	Aluminum glazed entry door, 3'-0" x 7'-2" single	3	EA	5,500.00	16,500
	98	Wire mesh pedestrian gate	1	EA	1,750.00	1,750
	99	Specialty hardware (panic, etc.) - allow	1	LS	50,000.00	50,000
	100	Card readers, etc. - allow	1	EA	50,000.00	50,000
	101					
	102	**INTERIOR DOORS**				259,750
	103					
	104					
C1030	105	**SPECIALTIES**				
	106					
	107	Interior code related signage - allow	10,471	SF	2.50	26,178
	108	Miscellaneous interior fittings - allow	10,471	SF	2.50	26,178
	109	Metal crash protection rail	7	LF	150.00	1,050
	110	Locker on curb	338	LF	550.00	185,900
	111	Locker room bench	25	LF	225.00	5,625
	112	Locker room bench, accessible	24	LF	300.00	7,200
	113	Toilet partition, accessible	8	EA	1,500.00	12,000
	114	Toilet partition, standard	7	EA	1,200.00	8,400
	115	Urinal screen	3	EA	850.00	2,550
	116	Sliding barn style partition at shower	2	EA	2,500.00	5,000
	117	Shower bench and accessories	9	EA	1,500.00	13,500
	118	Grab bar, pair	21	EA	350.00	7,350
	119	Toilet accessories - allow	1	LS	25,000.00	25,000
	120					
	121	**SPECIALTIES**				325,931
	122					
	123					
C3010	124	**WALL FINISHES**				
	125					
	126	Paint to walls	39,164	SF	3.50	137,074
	127					
	128	**WALL FINISHES**				137,074
	129					
	130					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.3 PHASE 2: OFFICE IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
C3020	131	**FLOOR FINISHES**				
	132					
	133	New flooring finish with base - allow	10,471	SF	15.00	157,065
	134					
	135	**FLOOR FINISHES**				157,065
	136					
	137					
C3030	138	**CEILING FINISHES**				
	139					
	140	New ceiling finish - allow	10,471	SF	20.00	209,420
	141					
	142	**CEILING FINISHES**				209,420
	143					
D1010	145	**ELEVATORS & LIFTS**				
	146					
	147	Elevator upgrades to existing passenger and freight systems	1	LS	315,000.00	315,000
	148					
	149	**ELEVATORS & LIFTS**				315,000
	150					
	151					
D1520	152	**PLUMBING**				
	153					
	154	Sanitary fixtures	63	FX		
	155	Waterclosets	18	EA	3,500.00	63,000
	156	Urinals	7	EA	2,000.00	14,000
	157	Lavatories	17	EA	2,800.00	47,600
	158	Kitchen sink	3	EA	3,500.00	10,500
	159	Sinks	1	EA	3,500.00	3,500
	160	Showers	9	EA	5,000.00	45,000
	161	Service sink	4	EA	6,000.00	24,000
	162	Drinking fountains/bottle fillers	4	EA	7,500.00	30,000
	163					
	164	Sanitary waste, vent and domestic service piping				
	165	Fixture rough-ins	63	EA	15,000.00	945,000
	166	Condensate drainage	10,471	SF	3.50	36,649
	167					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
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Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	168	Water treatment and storage				
	169	Electric water heaters	10,471	SF	4.00	41,884
	170					
	171	Gas distribution				
	172	None				
	173					
	174	Surface water drainage				
	175	None				
	176					
	177	Testing and sterilization				
	178	Testing and sterilization	95	HR	205.00	19,373
	179					
	180	Industrial Fixtures				
	181	Eyewash, complete with in-line tepid water heater	2	EA	6,600.00	13,200
	182					
	183	Industrial equipment				
	184	Compressed air and dryer				See Equipment
	185					
	186	Industrial distribution piping				
	187	Compressed air piping	10,471	SF	10.00	104,710
	188	Natural gas piping	10,471	SF	6.00	62,826
	189	Valves and specialties, including outlets	1	LS	41,884.00	41,884
	190					
	191	Miscellaneous Plumbing				
	192	Project requirements, project management, detailing, coordination, etc.	1	LS	270,562.68	270,563
	193					
	194					
	195	**PLUMBING**				1,773,689
	196					
	197					
D1530	198	**HVAC**				
	199					
	200	Piping, valves and specialties				
	201	Refrigerant piping, insulation valves and specialties	10,471	SF	8.00	83,768
	202					

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Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	203	Air handling units				
	204	VRF Heat pump system, electric	10,471	SF	15.00	157,065
	205					
	206	Air distribution and return				
	207	Galvanized sheetmetal ductwork, volume dampers, duct insulation, sound traps	10,471	SF	18.00	188,478
	208					
	209	Diffusers, registers and grilles				
	210	Diffusers, registers and grilles	10,471	SF	3.00	31,413
	211					
	212	Passive system				
	213	Electric radiant heaters	10,471	SF	10.00	104,710
	214	Electric wall radiators	10,471	SF	14.00	146,594
	215					
	216	Controls and instrumentation				
	217	DDC controls	10,471	SF	12.00	125,652
	218					
	219	Testing and balancing				
	220	Testing and balancing	10,471	SF	3.00	31,413
	221	Commissioning assistance	10,471	SF	1.50	15,707
	222					
	223	Unit Ventilation				
	224	Galvanized sheetmetal ductwork, exhaust	10,471	SF	3.00	31,413
	225	Stainless steel ductwork, exhaust	10,471	SF	1.00	10,471
	226	Exhaust fans	10,471	SF	5.00	52,355
	227					
	228	Miscellaneous HVAC				
	229	Project requirements, project management, detailing, coordination, etc.	1	LS	176,227.02	176,227
	230					
	231	**HVAC**				1,155,266
	232					
	233					
D1540	234	**FIRE PROTECTION**				
	235					
	236	Automatic wet sprinkler system	10,471	SF	12.00	125,652
	237	Room 109				
	238	FM200 and control panel	353	SF	300.00	105,900

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Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	239	Preaction double interlock system	1	LS	40,000.00	40,000
	240					
	241	**FIRE PROTECTION**				271,552
	242					
	243					
D5010	244	**ELECTRICAL DISTRIBUTION**				
	245					
	246	Main normal power				
	247	480V Distribution switchboard, 800A	1	LS	68,000.00	68,000
	248	Reuse existing panelboards				Existing
	249	Feeder conduit and wire	300	LF	1,250.00	375,000
	250	Power monitoring	1	LS	15,000.00	15,000
	251	Grounding	10,471	SF	0.50	5,236
	252					
	253	Machine and equipment power				
	254	Carpentry power				Existing
	255	Miscellaneous power connections	10,471	SF	1.50	15,707
	256					
	257	User convenience power				
	258	Receptacles	10,471	SF	6.00	62,826
	259					
	260	Trade demolition				
	261	Demo existing	10,471	SF	10.00	104,710
	262					
	263	Miscellaneous electrical				
	264	Project requirements, project management, detailing, coordination, etc.	1	LS	116,366.22	116,366
	265					
	266	**ELECTRICAL DISTRIBUTION**				762,845
	267					
	268					
D5020	269	**LIGHTING & BRANCH WIRING**				
	270					
	271	Lighting	10,471	SF	35.00	366,485
	272					
	273	**LIGHTING & BRANCH WIRING**				366,485
	274					
	275					

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Floor Area: **10,471 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D5030	276	**COMMUNICATION & SECURITY**				
	277					
	278	Telecommunications, including CAT6A cabling, conduit and outlets and WAPs	10,471	SF	18.00	188,478
	279	Fire alarm system, including new fire alarm panel and annunciator, fire alarm devices, conduit and cable	10,471	SF	18.00	188,478
	280	Security system, including access control, video surveillance monitoring, conduit and cable	10,471	SF	6.00	62,826
	281					
	282	**COMMUNICATION & SECURITY**				439,782
	283					
	284					
D5040	285	**AUDIO VISUAL SYSTEM**				
	286					
	287	A/V conduit only	10,471	SF	5.00	52,355
	288					
	289	**AUDIO VISUAL SYSTEM**				52,355
	290					
E10	291	**OTHER EQUIPMENT**				
	292					
	293	Residential grade kitchen appliances - allow	1	LS	10,000.00	10,000
	294	Bicycle rack	1	LS	3,500.00	3,500
	295	Miscellaneous equipment (AV, etc.) - allow	10,471	SF	10.00	104,710
	296					
	297	**OTHER EQUIPMENT**				118,210
	298					
	299					
E20	300	**CASEWORK**				
	301					
	302	Built-in casework	43	LF	600.00	25,800
	303	Miscellaneous fixed furnishings - allow	10,471	SF	3.00	31,413
	304					
	305	**CASEWORK**				57,213

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4.4 PHASE 3A: PROGRAMMING RESTRUCTURING **Date: 07/22/2022 Final**

Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	1					
A1010	2	**TRADE DEMOLITION**				
	3					
	4	Demolition as required - allow	8,119	SF	12.50	101,488
	5					
	6	**TRADE DEMOLITION**				101,488
	7					
C1010	60	**PARTITIONS**				
	61					
	62	New metal stud partition framing	1,794	SF	22.50	40,365
	63	Insulation at new interior partition	1,794	SF	5.00	8,970
	64	Gypsum board partition sheathing, taped and sanded	3,588	SF	7.50	26,910
	65	Patch and repair existing interior partitions and wall surrounding build-out - allow	2,500	SF	2.50	6,250
	66	Acoustic sealant	478	LF	5.00	2,390
	67	Wire mesh partition	172	LF	150.00	25,800
	68	Premium, removeable wire mesh partition	25	LF	50.00	1,250
	69					
	70	**PARTITIONS**				111,935
	71					
	72					
C1020	73	**INTERIOR DOORS**				
	74					
	75	Hollow metal door in hollow metal frame with hardware, 6'-0" x 7'-0" pair	1	PR	6,000.00	6,000
	76	Hollow metal door in hollow metal frame with hardware, 3'-0" x 7'-0" single	1	EA	3,500.00	3,500
	77	Hollow metal door in hollow metal frame with hardware and side narrow lite, 3'-0" x 7'-0" single	1	EA	3,850.00	3,850
	78	Wire mesh pedestrian gate	2	EA	1,750.00	3,500
	79	Wire mesh sliding gate	3	EA	3,500.00	10,500
	80	Overhead coiling door, 10'-0" x 9'-0"	1	EA	11,250.00	11,250
	81	Overhead coiling door, 12'-0" x 9'-0"	1	EA	13,500.00	13,500
	82	Specialty hardware (panic, etc.) - allow	1	LS	5,000.00	5,000

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	83	Card readers, etc. - allow	1	EA	5,000.00	5,000
	84					
	85	**INTERIOR DOORS**				62,100
	86					
	87					
C1030	88	**SPECIALTIES**				
	89					
	90	**Interior code related signage - allow**	8,119	SF	2.50	20,298
	91	Miscellaneous interior fittings - allow	8,119	SF	2.50	20,298
	92					
	93	**SPECIALTIES**				40,596
	94					
	95					
C3010	96	**WALL FINISHES**				
	97					
	98	Paint to walls	6,088	SF	3.50	21,308
	99					
	100	**WALL FINISHES**				21,308
	101					
	102					
C3020	103	**FLOOR FINISHES**				
	104					
	105	New flooring finish with base - allow	7,766	SF	15.00	116,490
	106					
	107	**FLOOR FINISHES**				116,490
	108					
	109					
C3030	110	**CEILING FINISHES**				
	111					
	112	New ceiling finish - allow	7,766	SF	20.00	155,320
	113					
	114	**CEILING FINISHES**				155,320
	115					
D1520	123	**PLUMBING**				
	124					
	125	Sanitary fixtures	5	FX		
	126	Waterclosets	1	EA	3,500.00	3,500
	127	Urinals	1	EA	2,000.00	2,000
	128	Lavatories	1	EA	2,800.00	2,800

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	129	Sinks	1	EA	3,500.00	3,500
	130	Drinking fountains/bottle fillers	1	EA	7,500.00	7,500
	131					
	132	Sanitary waste, vent and domestic service piping				
	133	Fixture rough-ins	5	EA	15,000.00	75,000
	134	Condensate drainage	7,766	SF	3.50	27,181
	135					
	136	Water treatment and storage				
	137	Electric water heaters	7,766	SF	20.00	155,320
	138					
	139	Gas distribution				
	140	None	7,766	SF	2.50	19,415
	141					
	142	Surface water drainage				
	143	None	7,766	SF	5.00	38,830
	144					
	145	Testing and sterilization				
	146	Testing and sterilization	7,766	SF	2.50	19,415
	147					
	148	Industrial Fixtures				
	149	Eyewash, complete with in-line tepid water heater	7,766	SF	2.50	19,415
	150					
	151	Industrial equipment				
	152	Compressed air and dryer				See Equipment
	153	Vacuum pump	1	LS	35,000.00	35,000
	154					
	155	Industrial distribution piping				
	156	Vacuum piping	7,766	SF	8.00	62,128
	157	Compressed air piping	7,766	SF	8.00	62,128
	158	Natural gas piping	7,766	SF	8.00	62,128
	159	Valves and specialties, including outlets	7,766	SF	3.00	23,298
	160	Connection to existing	7,766	SF	3.00	23,298
	161					
	162	Miscellaneous Plumbing				
	163	Project requirements, project management, detailing, coordination, etc.	1	LS	115,534.08	115,534
	164					
	165	**PLUMBING**				757,390
	166					

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	167					
D1530	168	**HVAC**				
	169					
	170	Piping, valves and specialties				
	171	Refrigerant piping, insulation valves and specialties	7,766	SF	6.00	46,596
	172					
	173	Air handling units				
	174	VRF Heat pump system, electric	7,766	SF	15.00	116,490
	175					
	176	Air distribution and return				
	177	Galvanized sheetmetal ductwork, volume dampers, duct insulation, sound traps	7,766	SF	18.00	139,788
	179	Diffusers, registers and grilles				
	180	Diffusers, registers and grilles	7,766	SF	3.00	23,298
	182	Passive system				
	183	Electric radiant heaters	7,766	SF	10.00	77,660
	184	Electric wall radiators	7,766	SF	14.00	108,724
	185					
	186	Controls and instrumentation				
	187	DDC controls	7,766	SF	12.00	93,192
	188					
	189	Testing and balancing				
	190	Testing and balancing	7,766	SF	3.00	23,298
	191	Commissioning assistance	7,766	SF	1.50	11,649
	192					
	193	Unit Ventilation				
	194	Galvanized sheetmetal ductwork, exhaust	7,766	SF	2.00	15,532
	195	Stainless steel ductwork, exhaust	7,766	SF	3.00	23,298
	196	Exhaust fans	7,766	SF	5.00	38,830
	197					
	198	Miscellaneous HVAC				
	199	Project requirements, project management, detailing, coordination, etc.	1	LS	129,303.90	129,304
	200					
	201	**HVAC**				847,659
	202					
	203					

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D1540	204	**FIRE PROTECTION**				
	205					
	206	Automatic wet sprinkler system - modify and reuse existing	7,766	SF	12.00	93,192
	207					
	208	**FIRE PROTECTION**				93,192
	209					
	210					
D5010	211	**ELECTRICAL DISTRIBUTION**				
	212					
	213	Main normal power				
	214	480V Distribution switchboard, 800A	1	LS	68,000.00	68,000
	215	Reuse existing panelboards				Existing
	216	Feeder conduit and wire	300	LF	1,500.00	450,000
	217	Power monitoring	1	LS	15,000.00	15,000
	218	Grounding	7,766	SF	0.50	3,883
	219					
	220	Machine and equipment power				
	221	Carpentry power				Existing
	222	2 ton bridge crane	1	EA	85,000.00	85,000
	223	Miscellaneous power connections	7,766	SF	3.00	23,298
	224					
	225	User convenience power				
	226	Receptacles	7,766	SF	6.00	46,596
	227					
	228	Trade demolition				
	229	Demo existing	7,766	SF	10.00	77,660
	230					
	231	Miscellaneous electrical				
	232	Project requirements, project management, detailing, coordination, etc.	1	LS	138,498.66	138,499
	233					
	234	**ELECTRICAL DISTRIBUTION**				907,936
	235					
	236					

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D5020	237	**LIGHTING & BRANCH WIRING**				
	238					
	239	Lighting	7,766	SF	30.00	232,980
	240					
	241	**LIGHTING & BRANCH WIRING**				232,980
	242					
	243					
D5030	244	**COMMUNICATION & SECURITY**				
	245					
	246	Telecommunications, including CAT6A cabling, conduit and outlets and WAPs				Not Required
	247	Fire alarm system, including new fire alarm panel and annunciator, fire alarm devices, conduit and cable	7,766	SF	18.00	139,788
	248	Security system, including access control, video surveillance monitoring, conduit and	7,766	SF	6.00	46,596
	249					
	250	**COMMUNICATION & SECURITY**				186,384
	251					
	252					
D5040	253	**AUDIO VISUAL SYSTEM**				
	254					
	255	A/V conduit only	7,766	SF	5.00	38,830
	256					
	257	**AUDIO VISUAL SYSTEM**				38,830
	258					
E10	259	**OTHER EQUIPMENT**				
	260					
	261	Machine shop equipment				
	262	CNC Lathe	1	EA	15,000.00	15,000
	263	Lathe Bed	1	EA		Relocate Existing
	264	Manual Lathes	1	EA		Relocate Existing
	265	Vertical Mill - Haas	1	EA		Relocate Existing
	266	Vertical Mill - Bridgeport	1	EA		Relocate Existing
	267	Drill press	1	EA		Relocate Existing
	268	Gear head drill press	1	EA		Relocate Existing
	269	Hydraulic press	1	EA		Relocate Existing
	270	Arbor Press	1	EA		Relocate Existing
	271	Hydraulic press	1	EA		Relocate Existing

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	272	Vertical band saw	1	EA		Relocate Existing
	273	Horizontal band saw	1	EA		Relocate Existing
	274	Hydraulic ironworker	1	EA		Relocate Existing
	275	Floor sander	1	EA		Relocate Existing
	276	Parts washer	1	EA		Relocate Existing
	277	Drum-mounted parts washer	1	EA		Relocate Existing
	278	Sand blaster cabinet	1	EA		Relocate Existing
	279	Pedestal grinder	1	EA		Relocate Existing
	280	Drill sharpener	1	EA		Relocate Existing
	281	End Mill sharpener	1	EA		Relocate Existing
	282	CNC tooling carts	1	EA		Relocate Existing
	283	Jib crane 1.5 tons	1	EA	2,500.00	2,500
	284	Plasma cutter	1	EA		Relocate Existing
	285	Automatic surface grinder	1	EA	7,500.00	7,500
	286	Pipe storage	1	EA		Relocate Existing
	287	Relocate and move existing equipment	200	HR	125.00	25,000
	288					
	289	Weld Shop				
	290	Welder	1	EA		Relocate Existing
	291	Stick welder	1	EA		Relocate Existing
	292	Mig Cart	1	EA		Relocate Existing
	293	Welder - Miller	1	EA		Relocate Existing
	294	Oxygen/Acetylene Cart	1	EA		Relocate Existing
	295	Welding fume extractor	1	EA		Relocate Existing
	296	Pedestal grinder	1	EA		Relocate Existing
	297	Welding /Frame Table	1	EA		Relocate Existing
	298	Tool workstation	1	EA		Relocate Existing
	299	Desk workstation	1	EA		Relocate Existing
	300	Cabinet storage	1	EA		Relocate Existing
	301	Tool cabinet	1	EA		Relocate Existing
	302	Table workstation	1	EA		Relocate Existing
	303	Storage shelves	1	EA		Relocate Existing
	304	Smog Hog	1	EA		Relocate Existing
	305	Metal cart	1	EA		Relocate Existing
	306	Scrap metal storage area	1	EA		Relocate Existing
	307	Scape metal cart	1	EA		Relocate Existing
	308	Relocate and move existing equipment	144	HR	125.00	18,000
	309					
	310	New inspection room				
	311	Hardness tester	1	EA		Relocate Existing

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Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	312	Measuring arm	1	EA		Relocate Existing
	313	Optical comparator	1	EA		Relocate Existing
	314	Tools storage	1	EA		Relocate Existing
	315	Granite block table	1	EA		Relocate Existing
	316	Spring compressor	1	EA		Relocate Existing
	317	Relocate and move existing equipment	48	HR	125.00	6,000
	318					
	319	Grip Building Area				
	320	Elevating platforms	2	EA		Relocate Existing
	321	Workstations	2	EA		Relocate Existing
	322	Tool cabinet	1	EA		Relocate Existing
	323	Parts washer	1	EA		Relocate Existing
	324	Scrap metal cart	1	EA		Relocate Existing
	325	Palette	1	EA		Relocate Existing
	326	Grip Washer	1	EA		Relocate Existing
	327	Relocate and move existing equipment	72	HR	125.00	9,000
	328					
	329	Steam Cleaning Area				
	330	Parts washer	1	EA		Relocate Existing
	331	Pressure washer	1	EA		Relocate Existing
	332	Steam cleaning bay	1	EA		Relocate Existing
	333	Hot pressure washer	1	EA		Relocate Existing
	334	Relocate and move existing equipment	32	HR	125.00	4,000
	335					
	336	Paint Group				
	337	Vehicle Duster	1	EA		Relocate Existing
	338	Air filtration	1	EA	3,000.00	3,000
	339	Parts washer	2	EA		Relocate Existing
	340	Air compressor	1	EA		Relocate Existing
	341	Shop vacuum	1	EA		Relocate Existing
	342	Bench buffer	1	EA		Relocate Existing
	343	Relocate and move existing equipment	56	HR	125.00	7,000
	344					
	345	Pulley Assembly Area				
	346	H Frame press	1	EA		Relocate Existing
	347	Pedestal grinder	1	EA		Relocate Existing
	348	Wheel racks storage	1	EA		Relocate Existing
	349	Depression work beam area	1	EA		Relocate Existing
	350	Sandblaster cabinet	1	EA		Relocate Existing
	351	Mobile cart	2	EA		Relocate Existing

SAN FRANCISCO CABLE CAR BARN
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(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.4 PHASE 3A: PROGRAMMING RESTRUCTURING **Date: 07/22/2022 Final**

Floor Area: **7,766 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	352	Tool workstation	1	EA		Relocate Existing
	353	LG pulley storage	2	EA		Relocate Existing
	354	Mobile shield	2	EA		Relocate Existing
	355	SM pulley storage	3	EA		Relocate Existing
	356	Tool box	1	EA		Relocate Existing
	357	Depression beam storage	1	EA		Relocate Existing
	358	Miscellaneous shelving	2	EA		Relocate Existing
	359	Relocate and move existing equipment	152	HR	125.00	19,000
	360					
	361	Car Cleaning and Level 2 Storage				
	362	Shed	1	EA		Relocate Existing
	363	55 gallon drums	5	EA		Relocate Existing
	364	1 gallon Adran Jel-R	6	EA		Relocate Existing
	365	1 gallon SF Blue	6	EA		Relocate Existing
	366	Storage rack	1	EA		Relocate Existing
	367	Metal garbage bin	2	EA		Relocate Existing
	368	Recycling bin	1	EA		Relocate Existing
	369	Compost bin	3	EA		Relocate Existing
	370	Sand pallet	6	EA		Relocate Existing
	371	Relocate and move existing equipment	248	HR	125.00	31,000
	372					
	373	Compact storage	1	LS	25,000	25,000
	374					
	375	Residential grade kitchen appliances - allow	1	LS	10,000	10,000
	376	Miscellaneous equipment (AV, etc.) - allow	8,119	SF	10.00	81,190
	377					
	378	**OTHER EQUIPMENT**				263,190
	379					
	380					
E20	381	**CASEWORK**				
	382					
	383	Built-in casework	23	LF	600.00	13,800
	384	Miscellaneous fixed furnishings - allow	8,119	SF	3.00	24,357
	385					
	386	**CASEWORK**				38,157

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4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	1					
A1010	2	**TRADE DEMOLITION**				
	3					
	4	Demolition as required - allow	3,440	SF	12.50	43,000
	5					
	6	**TRADE DEMOLITION**				43,000
	7					
C1010	94	**PARTITIONS**				
	95					
	96	New metal stud partition framing	2,370	SF	22.50	53,325
	97	Insulation at new interior partition	2,370	SF	5.00	11,850
	98	Gypsum board partition sheathing, taped and sanded	4,740	SF	7.50	35,550
	99	Patch and repair existing interior partitions and wall surrounding build-out - allow	1,500	SF	2.50	3,750
	100	Acoustic sealant	632	LF	5.00	3,160
	101	Interior glazing	32	SF	150.00	4,800
	102	Wire mesh partition	10	LF	150.00	1,500
	103					
	104	**PARTITIONS**				113,935
	105					
	106					
C1020	107	**INTERIOR DOORS**				
	108					
	109	Hollow metal door in hollow metal frame with hardware and half glass, 3'-0" x 7'-0" single	2	EA	4,000.00	8,000
		Hollow metal door in hollow metal frame with hardware and narrow side glass, 3'-0" x 7'-0" single	2	EA	3,850.00	7,700
	111	Wire mesh pedestrian gate	1	EA	1,750.00	1,750
	112	Specialty hardware (panic, etc.) - allow	1	LS	7,500.00	7,500
	113	Card readers, etc. - allow	1	EA	7,500.00	7,500
	114					
	115	**INTERIOR DOORS**				32,450
	116					
	117					
C1030	118	**SPECIALTIES**				
	119					
	120	Interior code related signage - allow	3,440	SF	2.50	8,600
	121	Removeable guardrail at Pits	240	LF	500.00	120,000

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4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	122	Miscellaneous interior fittings - allow	3,440	SF	2.50	8,600
	123					
	124	**SPECIALTIES**				137,200
	125					
	126					
C3010	127	**WALL FINISHES**				
	128					
	129	Paint to walls	6,240	SF	3.50	21,840
	130					
	131	**WALL FINISHES**				21,840
	132					
	133					
C3020	134	**FLOOR FINISHES**				
	135					
	136	New flooring finish with base - allow	3,440	SF	15.00	51,600
	137					
	138	**FLOOR FINISHES**				51,600
	139					
	140					
C3030	141	**CEILING FINISHES**				
	142					
	143	New ceiling finish - allow	3,440	SF	20.00	68,800
	144					
	145	**CEILING FINISHES**				68,800
	146					
	147					
D1520	166	**PLUMBING**				
	167					
	168	Sanitary fixtures	1	FX		
	169	Sinks	1	EA	3,500.00	3,500
	170					
	171	Sanitary waste, vent and domestic service piping				
	172	Fixture rough-ins	1	EA	15,000.00	15,000
	173	Condensate drainage	3,440	SF	3.50	12,040
	174					
	175	Water treatment and storage				
	176	Electric water heaters	3,440	SF	20.00	68,800
	177					

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Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	178	Gas distribution				
	179	None	3,440	SF	2.50	8,600
	180					
	181	Surface water drainage				
	182	None	3,440	SF	5.00	17,200
	183					
	184	Testing and sterilization				
	185	Testing and sterilization	3,440	SF	2.50	8,600
	186					
	187	Industrial Fixtures				
	188	Eyewash, complete with in-line tepid water heater	1	EA	6,000.00	6,000
	189					
	190	Industrial equipment				
	191	Compressed air and dryer				See Equipment
	192	Vacuum dust collector	1	LS	35,000.00	35,000
	193					
	194	Industrial distribution piping				
	195	Vacuum piping	3,440	SF	8.00	27,520
	196	Compressed air piping	3,440	SF	8.00	27,520
	197	Natural gas piping	3,440	SF	8.00	27,520
	198	Valves and specialties, including outlets	3,440	SF	3.00	10,320
	199	Connection to existing	3,440	SF	3.00	10,320
	200					
	201	Miscellaneous Plumbing				
	202	Project requirements, project management, detailing, coordination, etc.	1	LS	50,029.20	50,029
	203					
	204					
	205	**PLUMBING**				327,969
	206					
	207					
D1530	208	**HVAC**				
	209					
	210	Piping, valves and specialties				
	211	Refrigerant piping, insulation valves and specialties	3,440	SF	6.00	20,640
	212					
	213	Air handling units				
	214	VRF Heat pump system, electric	3,440	SF	18.00	61,920
	215					

SAN FRANCISCO CABLE CAR BARN
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Final Master Plan Documents
4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	216	Air distribution and return				
	217	Galvanized sheetmetal ductwork, volume dampers, duct insulation, sound traps	3,440	SF	18.00	61,920
	218					
	219	Diffusers, registers and grilles				
	220	Diffusers, registers and grilles	3,440	SF	3.00	10,320
	221					
	222	Passive system				
	223	Electric radiant heaters	3,440	SF	20.00	68,800
	224	Electric wall radiators	3,440	SF	15.00	51,600
	225					
	226	Controls and instrumentation				
	227	DDC controls	3,440	SF	12.00	41,280
	228					
	229	Testing and balancing				
	230	Testing and balancing	3,440	SF	2.50	8,600
	231	Commissioning assistance	3,440	SF	1.00	3,440
	232					
	233	Unit Ventilation				
	234	Galvanized sheetmetal ductwork, exhaust	3,440	SF	15.00	51,600
	235	Stainless steel ductwork, exhaust	3,440	SF	15.00	51,600
	236	Exhaust fans	3,440	SF	5.00	17,200
	237					
	238	Miscellaneous HVAC				
	239	Project requirements, project management, detailing, coordination, etc.	1	LS	80,805.60	80,806
	240					
	241	**HVAC**				529,726
	242					
	243					
D1540	244	**FIRE PROTECTION**				
	245					
	246	Automatic wet sprinkler system	3,440	SF	18.00	61,920
	247					
	248	**FIRE PROTECTION**				61,920
	249					
	250					

SAN FRANCISCO CABLE CAR BARN
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Final Master Plan Documents
4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D5010	251	**ELECTRICAL DISTRIBUTION**				
	252					
	253	Main normal power				
	254	480V Distribution switchboard, 800A	1	LS	68,000.00	68,000
	255	Reuse existing panelboards				Existing
	256	Feeder conduit and wire	300	LF	1,500.00	450,000
	257	Power monitoring	1	LS	15,000.00	15,000
	258	Grounding	3,440	SF	0.50	1,720
	259					
	260	Machine and equipment power				
	261	Carpentry power				Existing
	262	Miscellaneous power connections	3,440	SF	1.50	5,160
	263					
	264	User convenience power				
	265	Receptacles	3,440	SF	6.00	20,640
	266					
	267	Trade demolition				
	268	Demo existing	3,440	SF	10.00	34,400
	269					
	270	Miscellaneous electrical				
	271	Project requirements, project management, detailing, coordination, etc.	1	LS	107,085.60	107,086
	272					
	273	**ELECTRICAL DISTRIBUTION**				702,006
	274					
	275					
D5020	276	**LIGHTING & BRANCH WIRING**				
	277					
	278	Lighting	3,440	SF	30.00	103,200
	279					
	280	**LIGHTING & BRANCH WIRING**				103,200
	281					
	282					
D5030	283	**COMMUNICATION & SECURITY**				
	284					
	285	Telecommunications, including CAT6A cabling, conduit and outlets and WAPs				Not Required
	286	Fire alarm system, including new fire alarm panel and annunciator, fire alarm devices, conduit and cable	3,440	SF	18.00	61,920

SAN FRANCISCO CABLE CAR BARN
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4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	287	Security system, including access control, video surveillance monitoring, conduit and cable	3,440	SF	6.00	20,640
	288					
	289	**COMMUNICATION & SECURITY**				82,560
	290					
	291					
D5040	292	**AUDIO VISUAL SYSTEM**				
	293					
	294	A/V conduit only	3,440	SF	5.00	17,200
	295					
	296	**AUDIO VISUAL SYSTEM**				17,200
	297					
	298					
E10	299	**OTHER EQUIPMENT**				
	300					
	301	Prefabricated Paint Booth				
	302	Garmat Frontier Spray Booth #46008	1	LS	134,393.55	134,394
	303	Duct package	1	LS	7,300.00	7,300
	304	Mechanical installation	1	LS	23,360.00	23,360
	305	Electrical/air line	1	LS	8,833.00	8,833
	306	Roof framing	2	EA	401.50	803
	307	Gas Plumbing	1	EA	803.00	803
	308	Fire sprinkler system - included				0
	309	Start-up	1	EA	1,533.00	1,533
	310	Rental	2	EA	802.50	1,605
	311	Freight	1	EA	5,000.00	5,000
	312	Permit Service	1	EA	3,750.00	3,750
	313	Permit Package	1	EA	3,125.00	3,125
	314	Tax	8.625%	%	141,694.00	12,221
	315	Anchoring				Included
	316	Slab on grade - existing				Existing
	317					
	318	Spray Room				
	319	No Equipment				
	321	Carpentry				
	322	Sliding miter saw	1	EA		Relocate Existing
	323	Dust extractor	1	EA		Relocate Existing
	324	Vertical bandsaw	1	EA		Relocate Existing
	325	Standing drill press	1	EA		Relocate Existing

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4.5 PHASE 3B: CARPENTRY UPGRADES **Date: 07/22/2022 Final**

Roof Area **3,440 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	326	Bench grinder	1	EA		Relocate Existing
	327	Shop vac	1	EA		Relocate Existing
	328	Table saw	1	EA		Relocate Existing
	329	Dust collector	1	EA		Relocate Existing
	330	Band saw	1	EA		Relocate Existing
	331	Jointer	1	EA		Relocate Existing
	332	Planer	1	EA		Relocate Existing
	333	Sander	1	EA		Relocate Existing
	334	Table workstation	1	EA		Relocate Existing
	335	Storage shelves	1	EA		Relocate Existing
	336	Smog Hog	1	EA		Relocate Existing
	337	Metal cart	1	EA		Relocate Existing
	338	Scrap metal storage area	1	EA		Relocate Existing
	339	Scape metal cart	1	EA		Relocate Existing
	340	Spindle sander	1	EA		Relocate Existing
	341	Router Table - Replace	1	EA	1,000.00	1,000
	342	Air filtration system - Ceiling Mount OFCI	1	EA	600.00	600
	343	Paint Shaker	1	EA		Relocate Existing
	344	Dust extractor (HEPA)	1	EA		Relocate Existing
	345	Relocate and move existing equipment	184	HR	125.00	23,000
	346					
	347	Miscellaneous equipment (AV, etc.) - allow	3,440	SF	10.00	34,400
	348					
	349	**OTHER EQUIPMENT**				261,727
	350					
	351					
E20	352	**CASEWORK**				
	353					
	354	Miscellaneous fixed furnishings - allow	3,440	SF	3.00	10,320
	355					
	356	**CASEWORK**				10,320

SAN FRANCISCO CABLE CAR BARN
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4.6 PHASE 4: ROOF REPLACEMENT **Date: 07/22/2022 Final**

Floor Area: **20,700 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
A1010	1	**TRADE DEMOLITION**				
	2					
	3	Demo existing roof as required - allow	29,661	SF	10.00	296,610
	4					
	5	**TRADE DEMOLITION**				296,610
	6					
	7					
B1020	50	**ROOF CONSTRUCTION**				
	51					
	52	Seismic upgrade to roof as required	29,661	SF	45.00	1,334,745
	53					
	54	**ROOF CONSTRUCTION**				1,334,745
	55					
	80					
B3010	81	**ROOF COVERINGS**				
	82					
	83	New membrane roofing system with red aggregate	29,661	SF	30.00	889,830
	84	Protection board	29,661	SF	8.00	237,288
	85	Rigid insulation	29,661	SF	10.00	296,610
	86	Sheetmetal and flashing including parapet cap	29,661	SF	25.00	741,525
	87	Caulking and sealants	29,661	SF	5.00	148,305
	88					
	89	**ROOF COVERINGS**				2,313,558
	90					
	91					
B3020	92	**ROOF OPENINGS**				
	93					
	94	New skylight	240	SF	550.00	132,000
	95					
	96	**ROOF OPENINGS**				132,000
	97					
	134					
D1010	135	**ELEVATORS & LIFTS**				
	136	See Phase 2				
	137					
	138	**ELEVATORS & LIFTS**				
	139					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.6 PHASE 4: ROOF REPLACEMENT **Date: 07/22/2022 Final**

Floor Area: **20,700 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D1520	153	**PLUMBING**				
	154					
	155	Roof drains/overflow drains, scuppers and drainage system	29,661	SF	5.00	148,305
	156					
	157	**PLUMBING**				148,305
	158					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.7 PHASE 5: SEISMIC IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **0 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
5.2.1	1	**CHIMNEY SEPERATION**				
	2	Terminate connection between chimney and masonry wall above 2nd floor				
	3	Terminate connection - allow	320	SF	75.00	24,000
	4	Reinforced effected area as required - allow	320	SF	150.00	48,000
	5	New connection between main roof diaphragm and chimney - allow	15	TN	10,500.00	157,500
	6	Miscellaneous metals and rough carpentry - allow	1	LS	90,000.00	90,000
	7	Patch and repair as required - allow	1	LS	35,000.00	35,000
	8					
	9	**Total Direct Cost**				**354,500**
	10					
	11	**ADD MARKUPS (CUMULATIVE)**				
	12	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	354,500.00	70,900
	13	MARKET FACTOR	5.0%	%	425,400.00	21,270
	14	OVERHEAD AND PROFIT	10.0%	%	446,670.00	44,667
	15	BONDING AND INSURANCE	2.5%	%	491,337.00	12,283
	16	DESIGN CONTINGENCY	30.0%	%	503,620.43	151,086
	17	**BASE CONSTRUCTION COST (Unescalated)**			**654,706.55**	
	18	ESCALATION - PHASE 5	32.6%	%	213,657.00	69,725
	19	**BASE CONSTRUCTION COST (Escalated)**			**724,431.32**	**0**
	20					
	21	**CHIMNEY SEPERATION**				**724,431**
	22					
5.2.2A	23	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET**				
	24	**SHOTCRETE/DOWELS**				
	25	Remove existing shotcrete layer, protect existing rebar dowels to existing masonry wall in place - allow	16,610	SF	12.50	207,625
	26	Reinforced effected area as required - allow	16,610	SF	15.00	249,150
	27	Anchor new reinforcing into existing grade beam - allow	302	LF	500.00	151,000
	28	Foundation rework - allow	1	LS	150,000.00	150,000
	29	New shotcrete wall	16,610	SF	45.00	747,450
	30	Miscellaneous metals and rough carpentry - allow	1	LS	300,000.00	300,000
	31	Patch and repair as required - allow	1	LS	150,000.00	150,000
	32					
	33	**Total Direct Cost**				**1,955,225**
	34					
	35	**ADD MARKUPS (CUMULATIVE)**				
	36	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	1,955,225.00	391,045
	37	MARKET FACTOR	5.0%	%	2,346,270.00	117,314
	38	OVERHEAD AND PROFIT	10.0%	%	2,463,583.50	246,358
	39	BONDING AND INSURANCE	2.5%	%	2,709,941.85	67,749
	40	DESIGN CONTINGENCY	30.0%	%	2,777,690.40	833,307
	41	**BASE CONSTRUCTION COST (Unescalated)**			**3,610,997.52**	
	42	ESCALATION - PHASE 5	32.6%	%	1,178,412.00	384,563
	43	**BASE CONSTRUCTION COST (Escalated)**			**3,995,560.17**	**0**
	44					
	45	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET**				**3,995,560**

SAN FRANCISCO CABLE CAR BARN
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(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
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4.7 PHASE 5: SEISMIC IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **0 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	46					
5.2.2B	47	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET**				
	48	**FIBER WRAPS**				
	49	Apply fiber wrap (fiber reinforced polymer) on the interior surface of existing shotcrete walls - allow for (2) layers both horizontally and vertically	16,610	SF	180.00	2,989,800
	50	Attach to existing grade beam as required - allow	302	LF	500.00	151,000
	51	Foundation rework - allow	1	LS	150,000.00	150,000
	52	Miscellaneous metals and rough carpentry - allow	1	LS	100,000.00	100,000
	53	Patch and repair as required - allow	1	LS	150,000.00	150,000
	54					
	55	**Total Direct Cost**				**3,540,800**
	56					
	57	**ADD MARKUPS (CUMULATIVE)**				
	58	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	3,540,800.00	708,160
	59	MARKET FACTOR	5.0%	%	4,248,960.00	212,448
	60	OVERHEAD AND PROFIT	10.0%	%	4,461,408.00	446,141
	61	BONDING AND INSURANCE	2.5%	%	4,907,548.80	122,689
	62	DESIGN CONTINGENCY	30.0%	%	5,030,237.52	1,509,071
	63	**BASE CONSTRUCTION COST (Unescalated)**			**6,539,308.78**	
	64	ESCALATION - PHASE 5	32.6%	%	2,134,036.00	696,421
	65	**BASE CONSTRUCTION COST (Escalated)**			**7,235,729.50**	**0**
	66					
	67	**SOUTH AND EAST WALLS ALONG WASHINGTON/MASON STREET**				**7,235,730**
	68					
5.2.3	69	**CONCRETE MASONRY UNIT WALL AT GRID LINE G**				
	70					
	71	New shear wall from grade beam to 2M floor	900	SF	1,500.00	1,350,000
	72	Foundation rework - allow	1	LS	50,000.00	50,000
	73	Miscellaneous metals and rough carpentry - allow	1	LS	250,000.00	250,000
	74	Patch and repair as required - allow	1	LS	45,000.00	45,000
	75					
	76	**Total Direct Cost**				**1,695,000**
	77					
	78	**ADD MARKUPS (CUMULATIVE)**				
	79	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	1,695,000.00	339,000
	80	MARKET FACTOR	5.0%	%	2,034,000.00	101,700
	81	OVERHEAD AND PROFIT	10.0%	%	2,135,700.00	213,570
	82	BONDING AND INSURANCE	2.5%	%	2,349,270.00	58,732
	83	DESIGN CONTINGENCY	30.0%	%	2,408,001.75	722,401
	84	**BASE CONSTRUCTION COST (Unescalated)**			**3,130,402.28**	
	85	ESCALATION - PHASE 5	32.6%	%	1,021,575.00	333,381
	86	**BASE CONSTRUCTION COST (Escalated)**			**3,463,782.78**	**0**
	87					
	88	**CONCRETE MASONRY UNIT WALL AT GRID LINE G**				**3,463,783**
	89					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.7 PHASE 5: SEISMIC IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **0 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
5.2.4	90	**ADDING NEW SEISMIC FORCE AT GRID LINES E**				
	91					
	92	New shear wall from grade beam to 2M floor	600	SF	1,500.00	900,000
	93	Foundation rework - allow	1	LS	50,000.00	50,000
	94	Miscellaneous metals and rough carpentry - allow	1	LS	150,000.00	150,000
	95	Protect existing passenger elevator as required - allow	1	LS	7,500.00	7,500
	96	Patch and repair as required - allow	1	LS	45,000.00	45,000
	97					
	98	**Total Direct Cost**				**1,152,500**
	99					
	100	**ADD MARKUPS (CUMULATIVE)**				
	101	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	1,152,500.00	230,500
	102	MARKET FACTOR	5.0%	%	1,383,000.00	69,150
	103	OVERHEAD AND PROFIT	10.0%	%	1,452,150.00	145,215
	104	BONDING AND INSURANCE	2.5%	%	1,597,365.00	39,934
	105	DESIGN CONTINGENCY	30.0%	%	1,637,299.13	491,190
	106	**BASE CONSTRUCTION COST (Unescalated)**			**2,128,488.86**	
	107	ESCALATION - PHASE 5	32.6%	%	694,610.00	226,679
	108	**BASE CONSTRUCTION COST (Escalated)**			**2,355,167.70**	**0**
	109					
	110	**ADDING NEW SEISMIC FORCE AT GRID LINES E**				**2,355,168**
	111					
5.2.5	112	**MAIN ROOF DIAPHRAGM**				
	113					
	114	Upgrade existing diagonal bracing member and adding new diagonal bracing to enhance diaphragm capacity as required - allow	11,600	SF	55.00	638,000
	115	Miscellaneous metals and rough carpentry - allow	1	LS	150,000.00	150,000
	116	Foundation rework - allow	1	LS	50,000.00	50,000
	117	Patch and repair as required - allow	11,600	SF	15.00	174,000
	118					
	119	**Total Direct Cost**				**1,012,000**
	120					
	121	**ADD MARKUPS (CUMULATIVE)**				
	122	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	1,012,000.00	202,400
	123	MARKET FACTOR	5.0%	%	1,214,400.00	60,720
	124	OVERHEAD AND PROFIT	10.0%	%	1,275,120.00	127,512
	125	BONDING AND INSURANCE	2.5%	%	1,402,632.00	35,066
	126	DESIGN CONTINGENCY	30.0%	%	1,437,697.80	431,309
	127	**BASE CONSTRUCTION COST (Unescalated)**			**1,869,007.14**	
	128	ESCALATION - PHASE 5	32.6%	%	609,931.00	199,045
	129	**BASE CONSTRUCTION COST (Escalated)**			**2,068,051.86**	**0**
	130					
	131	**MAIN ROOF DIAPHRAGM**				**2,068,052**
	132					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.7 PHASE 5: SEISMIC IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **0 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
5.2.6	133	**OTHER ADDED ELEMENTS FOR SEISIMC FORCE**				
	134	East Wall of North Exit Stair				
	135	Add diagonal bracing elements from floor 2M to foundation between existing columns	900	SF	125.00	112,500
	136	Miscellaneous metals and rough carpentry - allow	1	LS	50,000.00	50,000
	137	Patch and repair as required - allow	1	LS	25,000.00	25,000
	138	Expansion Joint Separation at Roof Structure				
	139	Add collector for transferring seismic force in west portion of roof to CMU wall below - allow	10	LF	3,500.00	35,000
	140	Add collector for transferring seismic force in north-west portion of roof to CMU wall below - allow	20	LF	3,500.00	70,000
	141	Miscellaneous metals and rough carpentry - allow	1	LS	35,000.00	35,000
	142	Patch and repair as required - allow	1	LS	25,000.00	25,000
	143	Foundation rework - allow	1	LS	50,000.00	50,000
	144					
	145	**Total Direct Cost**				**402,500**
	146					
	147	**ADD MARKUPS (CUMULATIVE)**				
	148	GENERAL CONDITIONS AND REQUIREMENTS	20.0%	%	402,500.00	80,500
	149	MARKET FACTOR	5.0%	%	483,000.00	24,150
	150	OVERHEAD AND PROFIT	10.0%	%	507,150.00	50,715
	151	BONDING AND INSURANCE	2.5%	%	557,865.00	13,947
	152	DESIGN CONTINGENCY	30.0%	%	571,811.63	171,543
	153	**BASE CONSTRUCTION COST (Unescalated)**			**743,355.11**	
	154	ESCALATION - PHASE 5	32.6%	%	242,586.00	79,165
	155	**BASE CONSTRUCTION COST (Escalated)**			**822,520.56**	**0**
	156					
	157	**OTHER ADDED ELEMENTS FOR SEISIMC FORCE**				**822,521**
	158					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.8 EXTERIOR IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **15,579 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
	1					
B2010	2	**EXTERIOR WALLS**				
	3					
	4	Clean masonry to remove general soiling, biological growth, efflorescence, and stains	15,579	SF	15.00	233,685
	5	Apply coating to masonry	15,579	SF	10.00	155,790
	6	Replace or repair existing brick as required - allow for 30% replacement	15,579	SF	65.00	1,012,635
	7	Replace deteriorated joints as required	15,579	SF	25.00	389,475
	8	Repair or replace metal parapet coping as required - see Phase 4	15,579	SF	0.00	0
	9	Install new joint sealant at base of building	584	LF	75.00	43,800
	10	Repair leaking pipes at East Elevation as required - allow	1	LS	25,000.00	25,000
	11	Exterior railings - clean, refinish and/or paint existing	100	LF	500.00	50,000
	12	Scaffolding	15,579	SF	5.00	77,895
	13					
	14	**EXTERIOR WALLS**				1,988,280
	15					
	16					
B2020	17	**EXTERIOR WINDOWS**				
	18					
	19	Repair existing windows are required - replace cracked glass, replace missing or damaged hardware, clean, adjust or lubricate all sashes, paint all windows	3,350	SF	350.00	1,172,500
	20	Repair existing clerestory windows are required - clean, adjust or lubricate all sashes, install new sealants, paint all windows	510	SF	200.00	102,000
	21					
	22	**EXTERIOR WINDOWS**				1,274,500
	23					
	24					

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.8 EXTERIOR IMPROVEMENTS **Date: 07/22/2022 Final**

Floor Area: **15,579 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
B2030	25	**EXTERIOR DOORS**				
	26					
	27	Refurbish all exterior doors as required - clean, adjust, or lubricate, install new sealants, paint or refinish	10	EA	25,000.00	250,000
	28					
	29	**EXTERIOR DOORS**				250,000
	30					
B3010	31					
	32	**ROOF COVERINGS**				
	33					
	34	New membrane roofing - see Phase 4				
	35					
	36	**ROOF COVERINGS**				
	37					
B3020	38					
	39	**ROOF OPENINGS**				
	40					
	41	Clean and refinish all existing skylight frames and replace all joint sealants	7,030	SF	150.00	1,054,500
	42					
	43	**ROOF OPENINGS**				1,054,500

SAN FRANCISCO CABLE CAR BARN
ROM ESTIMATE OF PROBABLE CONSTRUCTION COST
(AN OPINION OF PROBABLE CONSTRUCTION COSTS)
BASED ON FINAL MASTERPLAN DOCUMENTS
4.9 WINDING MOTORS **Date: 07/22/2022 Final**

Floor Area: **846 GSF**

Elem.	#	Description	Quantity	Unit	Unit Cost	Total
D5010	161	**ELECTRICAL DISTRIBUTION**				
	162					
	163	Main normal power				
	164	Machine and equipment power				
	165	Winding Motors	4	EA	150,000.00	600,000
	166	Isolation transformers	4	EA	120,000.00	480,000
	167	Feeder conduit and wire	800	LF	350.00	280,000
	168					
	169	User convenience power				
	170	Receptacles				Existing
	171					
	172	Trade demolition				
	173	Remove existing winding motors/transformers	480	HR	205.00	98,400
	174	Temporary power	1	WK	10,000.00	10,000
	175					
	176	Miscellaneous electrical				
	177	Project requirements, project management, detailing, coordination, etc	1	LS	264,312.00	264,312
	178					
	179	**ELECTRICAL DISTRIBUTION**				1,732,712
	192					

M LEE CORPORATION

Construction Management & Consulting
Estimating & Scheduling
Since 1992

M Lee Corporation

M Lee Corporation was established in the San Francisco Bay Area in 1992 to provide quality construction cost estimating, scheduling and construction, program and project management support services. Since its incorporation, M Lee Corporation have provided professional construction services for over 1,400 projects with an estimated value of over $40 billion, spanning all services and disciplines, scopes and sizes. Having worked in the San Francisco Bay Area over the last 29 years, our knowledge of the local construction market has proved to be a valuable asset to our clients.

Key Professionals

Martin Lee

Founding principal and chief estimator of M Lee Corporation, Martin is a professional civil engineer (PE), chartered quantity surveyor (CQS), and certified professional estimator (CPE)-Lifetime by ASPE with over 35 years of practical experience in construction cost management and consulting services in the San Francisco Bay Area. Prior to establishing M Lee Corporation, Martin gained extensive experience working with a renowned general contractor/construction management firm and an international cost consulting firm. Working on over 1,400 projects with an estimated construction value of over $40 billion, Martin is knowledgeable of local construction practice and pricing. He enjoys and excels in construction cost and schedule management.

Franklin Lee

Principal and project manager/senior cost estimator of M Lee Corporation, Franklin is a professional civil engineer (PE), LEED accredited professional and certified estimating professional (CEP) by AACE. Franklin holds a B.S. in Civil and Environmental Engineering from University of California, Berkeley and a M.S. in Construction Engineering and Management from Stanford University. Prior to joining M Lee Corporation Franklin worked for a nationally renowned general contractor/construction management firm. Franklin has provided cost estimating, scheduling and project management services on over 500

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SFMTA

Cable Car Barn Rehabilitation and Upgrades

SFMTA Citizens' Advisory Council (CAC)

Engineering, Maintenance, and Safety Committee (EMSC)

February 22, 2023

Project Description

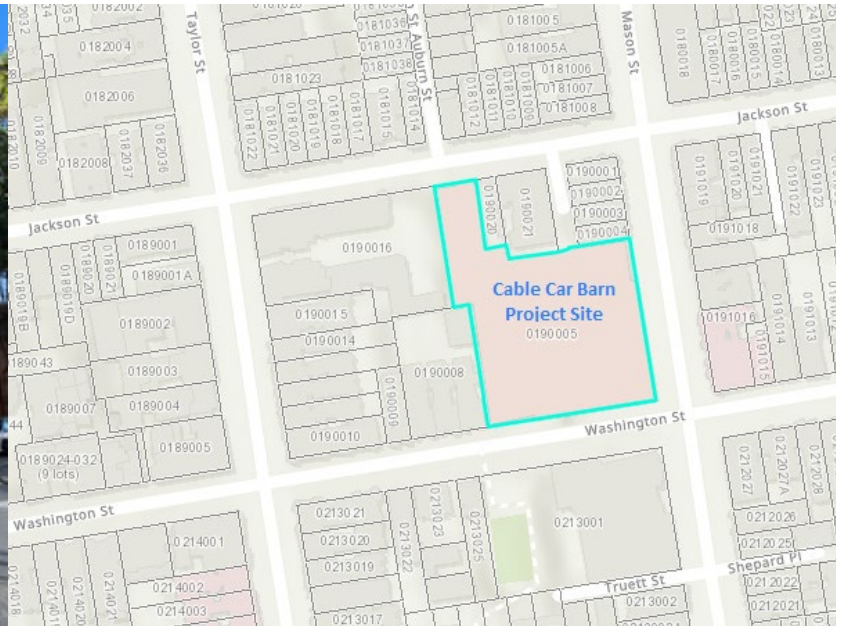
Location: 1201 Mason Street in the Nob Hill neighborhood.

Purpose: Critical improvements to improve working conditions and modernize electrical operations.

General Scope: Rehabilitate the Cable Car Barn, including substantial investments to upgrade the HVAC, Fire/Life Safety Systems, office spaces, roof, 10- and 40-ton cranes, cable rewinder and holdback machinery, restrooms, and other associated upgrades.

Project Status: Master Plan completed. Pre-Development (PLN) Phase *in-progress*.

Cable Car Barn & Museum | Exterior View
SFMTA Photograph, November 2022



Cable Car Barn Project Site: 1201 Mason Street
Master Plan | June 30, 2022

Standards for Rehabilitation

The Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67, 1990)
which are included in the Treatment Standards

The Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68, 1995) consists of four treatment standards—Preservation, Rehabilitation, Restoration, and Reconstruction—and are regulatory for NPS Grants–in–Aid programs.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

U00778

SFMTA Photo Archives: Destroyed Washington and Mason Car House & Powerhouse After 1906 Earthquake and Fire, May 7, 1906

Project Objectives

- **Electrical Modernization** – *replacement of main switchgear and electrical equipmt*
- **Accessibility Improvements** – *for SFMTA workplace and Public Visitors*
- **Seismic Retrofitting** – *make structurally safe & code compliant*
- **Exterior Rehabilitation** – *preserving Muni's crown jewel*
- **Improve Safety & Working Conditions** *for SFMTA Workforce*

Cable Machinery Winding Wheels, 1970
SFMTA Photo Archives M0817_1

Cable Car Barn Group Photo of Shop Staff, 2021
SFMTA Photo Archives 210819_CC_Barn_09_Comp

Electrical Modernization

Main driver of the **rehabilitation and upgrade work**

- Objective is to replace out of date and original equipment (1984)
- Existing equipment at lifecycle end – subject to increased fire hazard from panels and switchboards

Major Equipment Upgrades:

- Main Medium Voltage Service Entrance Switchgear
- Medium Voltage Transformer
- Low Voltage Switchboard
- AC and DC Electrical Panel
- Remote Terminal Units (RTU) and Supervised Control and Data Acquisition (SCADA)
- Transfer Switch and Emergency Generator Hookups

Medium Voltage Service Entrance Switchgear, 2.5 MW Medium Voltage Transformer and 480 V Switchboard

Motor Control Center (MCC)

Accessibility Improvements

Accessibility compliance and improvements required for Cable Car Barn work staff and Museum patrons:

- Path of Travel Widening
- Doorway Widening
- Restroom Accessory Replacement
- Wayfinding Signage
- Locker and Office Space Renovations
- Entrance Ramp and Landing Slope Softening
- Handrail Refurbishment

Non-compliant lavatory and shower (Men 203).

Non-compliant lavatory (Women 106).

Seismic Retrofitting

Initial Seismic Evaluation - Structural and Non-Structural Life Hazard Issues

Conceptual Seismic Improvements:

- South and east concrete wall strengthening
- Shear wall addition at the east side of the passenger elevator
- Shear wall addition for 2nd Fl wall reinforcement
- Stair bracing continuation next to the north wall
- Roof strengthening including existing diagonal brace upgrades and new braces
- Chimney separation through introduction of an expansion joint

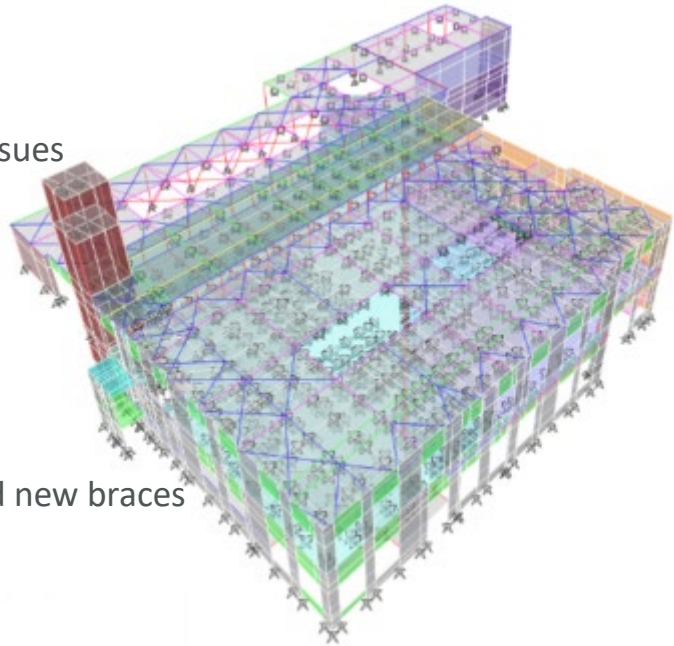
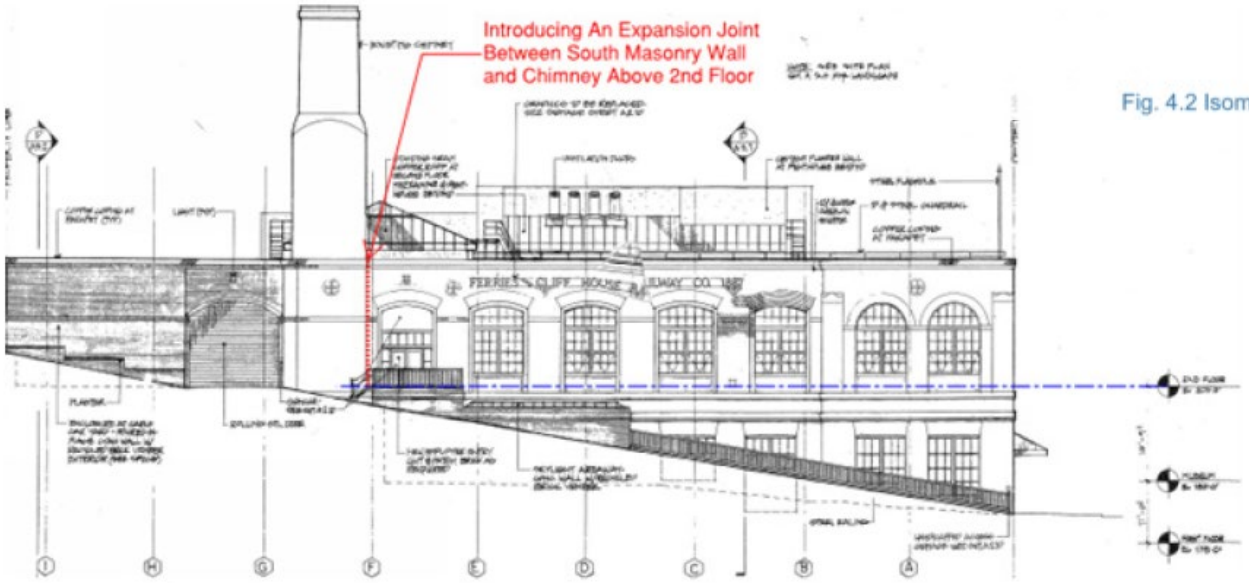


Fig. 4.2 Isometric 3D View of the ETABS Model



Chimney Separation

Exterior Rehabilitation

Brick Masonry

- Removal of general soiling, efflorescence, and stains
- Crack and spall repair
- Joints replacement
- Replace poorly matching masonry repairs and mortar joints for uniformity;
- Repair leaking pipes
- Repaint the brick masonry at the north lot line elevations
- Install sealant joints at the base of the building
- Repair metal parapet coping

Roof

- Replace roof membrane, insulation, drains, flashing
- Installation of equipment roof curbs
- Refinish skylight frames
- Replace sealant joints

Improve Safety & Working Conditions
for SFMTA Workforce and General Public

- 10-ton bridge crane to a 20-ton bridge crane with an extension
- Addition of a 3-ton free standing jib crane
- Addition of a 2-ton bridge crane
- Replacement of the passenger and freight elevators
- Replacement of the fire suppression system

- Upgrades to the heating, ventilation, and air conditioning (HVAC) system
- Upgrades to the weld room, inspection room, machine shop, carpentry area, paint booth, and assembly areas
- Installation of glass partitions for museum space
- Installation of EV chargers and shop compact storage units
- Addition of lactation room and bike storage room
- Additional facility electrical, plumbing, and structural work

Phasing Plan (Phases 1 thru 5)

Phasing Plans

Phase 1A

Level 2: 12kV electrical upgrade. PG&E permit process for 12kV electrical and all power upgrade. Clean agent installation and plumbing upgrade (eye wash)

Phase 1B

Level 1: Existing 10-ton bridge crane upgrade to 20-ton and extension, including structural work

Level 1M: Office area addition and proposed walkway, including structural, MEP, fire alarm, fire sprinkler work.

Phase 2

Level 1: Restroom, locker and office upgrades, including MEP work. Upgrade fire suppression system (remove halon system)

Level 1M: Glass partition upgrade, HVAC upgrade museum (installing HVAC system), restroom upgrades, including MEP work.

Level 2: Restroom upgrades, including MEP work. Bike storage room addition

Level 2M: Office renovations including MEP work

All levels: Passenger and freight elevator upgrades, including structural work for guide rails (all levels)

Phase 3A

Level 1: Reallocation of weld room and new inspection room. Existing machine shop, pulley assembly area and steam cleaning/weld area upgrade. 2-ton bridge crane addition. MEP work.

Level 1M: Compact storage including structural work

Level 2: Reallocation of grip building area from level 1, including MEP work.

Phase 3B

Level 2: Carpentry and office area upgrades including paint booth and spray booth Demolition of existing break room on upper level. MEP work. replace heating units in inspection pits

Phase 4

Remaining MEP upgrade, new skylights and entire roof replacement

Phase 5

Seismic retrofit work

Other scope

Exterior improvements:

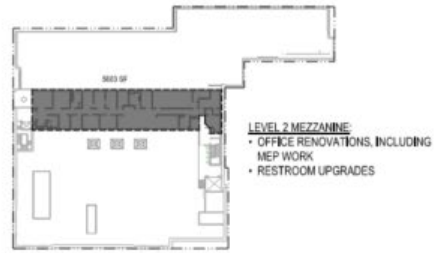
See Appendix A7- Exterior Conditions Memo & A13 - Cost Estimate for details

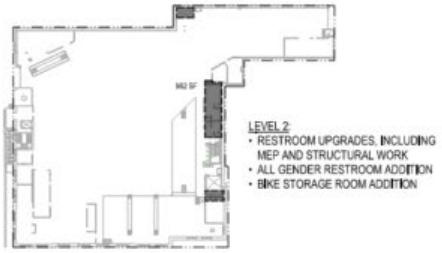
Winding motors upgrade (optional):

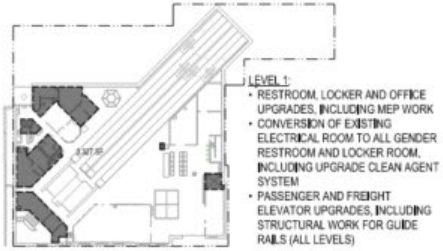
See Appendix A13 - Cost Estimate for details

1A PHASE 1A | 12KV SWITCHGEAR UPGRADE

1B PHASE 1B | BRIDGE CRANE UPGRADE







2 PHASE 2 | OFFICE IMPROVEMENTS

Planning Schedule

Task	Begin Date	End Date	Duration (Months)
Planning Phase			
Master Plan and Pre-Development Reports	July 22, 2020	March 24, 2023	32
Preliminary Engineering Phase			
Environmental Clearance	March 25, 2023	March 27, 2024	12
Preliminary Engineering Report (30% design)	March 25, 2023	March 27, 2024	12
Detailed Design Phase			
Detailed Design (65% design)	March 28, 2024	November 29, 2024	8
Detailed Design (100% design)	November 30, 2024	September 30, 2025	9
Permitting	October 1, 2025	November 30, 2025	2
Contracting Phase			
Advertise Construction	December 1, 2025	March 6, 2026	3
Award Construction Contract	March 7, 2026	May 10, 2026	2
Construction Management Phase			
Construction Notice to Proceed	May 11, 2026		
Substantial Completion		May 20, 2031	61
Administrative Closure Phase			
Contract Closeout	May 21, 2031	August 19, 2031	3
Project Closeout	August 20, 2031	November 18, 2031	3

AttaAttachment 3chment 1

Thank you!

Questions?

Project Team

- Quon Chin (Project Manager)
- Christian Kalinowski (Deputy Project Manager)
- Eun Joo Cho (Project Architect)

Cable Car Barn Rehabilitation Project Update

SFMTA Citizens' Advisory Council (CAC)

Engineering, Maintenance, and Safety Committee (EMSC)

March 24, 2024

Project Description & Status

- **Location:** 1201 Mason Street in the Nob Hill neighborhood.
- **Purpose:** Critical improvements to improve working conditions and modernize electrical operations.
- **General Scope:** Rehabilitate the Cable Car Barn, including substantial investments to upgrade the HVAC, Fire/Life Safety Systems, office spaces, roof, 10- and 40-ton cranes, cable rewinder and holdback machinery, restrooms, and other associated upgrades.
- **Project Status:** Overall project on-hold due to limited funding. Proceeding with Geotech for CEQA environmental submission to SF Planning. *Master Plan completed. Pre-Development (PLN) Phase - nearly completed. PDR in approval phase.*

Cable Car Barn & Museum | Exterior View
SFMTA Photograph, November 2022

Cable Car Barn Project Site: 1201 Mason Street
Master Plan | June 30, 2022

Key Project Issues

- **PG&E Electrification**
  - New electrical switchgear room will trigger a PG&E service application.
  - Explored “grandfather” clause to maintain existing electrical 12kv service feeds.
  - An upgraded service application will be required to be submitted to PG&E.
  - WDT3 (Wholesale Distribution Tariff, Rev. 3) – lengthy process between 3-5 years
  - Capital infrastructure investment – ***high capital cost*** *to SFMTA for PG&E Engineering & Construction*
- **Environmental Clearances**
  - Environmental clearance processes – ***lengthy timeline***
    Procuring an environmental consultant with an RFP advertised in 1Q 2024
  - CEQA (California Environmental Quality Act) Clearance
  - NEPA (National Environmental Policy Act) Clearance
  - **NEPA likely** required - *SFMTA is seeking* ***Federal Grants and Funding***
- **Project Funding**
  - Capital Improvements Program (CIP) **Funding Necessary** *to fund the overall project*
  - Cable Car Barn Rehabilitation – ***high capital cost*** *due to complex sequencing while maintaining existing operations of historic and iconic facility*
  - **Alternate Project Delivery Methods** – *evaluate CMAR/CMGC (Construction Management At Risk) or PDB (Progressive Design Build) to leverage schedule and cost certainty*

Project Status

- **Master Plan**
  - Submission completed with the Master Plan's comment resolution log closed.
  - Master Plan Phase **completed**
- **Pre-Development Phase**
  - Pre-Development Phase (PLN): Milestone achieved w/completion of Pre-Development Report (PDR)
  - PDR Comment Resolution Log: comments addressed w/stakeholders. *In approval process*
  - Pre-Development Phase: **Memorialize completion**
- **Interim Phase**
  - Task 1A: Construct Electrical Switchgear Room – *conceptualized as an **Enabling Project**, put on hold*
  - DBI: Convened a project introductory meeting w/DBI - *on schedule, code triggers & enabling project*
- **Preliminary Engineering (PE) Phase** – *ON HOLD*
  - Next design phase will advance design work to: 10% or 30% level – *pending available funding*
  - Commencement of PE Phase - *determined by SFMTA's Capital Improvements Program (CIP)*
  - CIP program funding needed for coming fiscal years - *including FY2024-2025*
- **Next Steps** – *near term 2Q/3Q 2024*
  - **Work on Environmental Clearance: CEQA & NEPA**
  - **CEQA**: Obtain Categorical Exemption from SF Planning Review – *pending Geotechnical Report*
    - Geotechnical Report & A/E design support – *supplement environmental services*
    - SF Planning determined **ACOA *not required*** *(Administrative Certificate of Appropriateness)*
  - **NEPA**: on-board an environmental consultant to work on the NEPA approval process
    - RFP Due: *mid-March*. Contract negotiations: *mid-May 2024*
    - Ideal would be a NEPA Categorical Exclusion (CE)

MP Phasing Plan (Phases 1 thru 5) *61 mos.*

Phasing Plans

Phase 1A

Level 2: 12kV electrical upgrade. PG&E permit process for 12kV electrical and all power upgrade. Clean agent installation and plumbing upgrade (eye wash)

Phase 1B

Level 1: Existing 10-ton bridge crane upgrade to 20-ton and extension, including structural work

Level 1M: Office area addition and proposed walkway, including structural, MEP, fire alarm, fire sprinkler work.

Phase 2

Level 1: Restroom, locker and office upgrades, including MEP work. Upgrade fire suppression system (remove halon system)

Level 1M: Glass partition upgrade, HVAC upgrade museum (installing HVAC system), restroom upgrades, including MEP work.

Level 2: Restroom upgrades, including MEP work. Bike storage room addition

Level 2M: Office renovations including MEP work

All levels: Passenger and freight elevator upgrades, including structural work for guide rails (all levels)

Phase 3A

Level 1: Reallocation of weld room and new inspection room. Existing machine shop, pulley assembly area and steam cleaning/weld area upgrade. 2-ton bridge crane addition. MEP work.

Level 1M: Compact storage including structural work

Level 2: Reallocation of grip building area from level 1, including MEP work.

Phase 3B

Level 2: Carpentry and office area upgrades including paint booth and spray booth Demolition of existing break room on upper level. MEP work. replace heating units in inspection pits

Phase 4

Remaining MEP upgrade, new skylights and entire roof replacement

Phase 5

Seismic retrofit work

Other scope

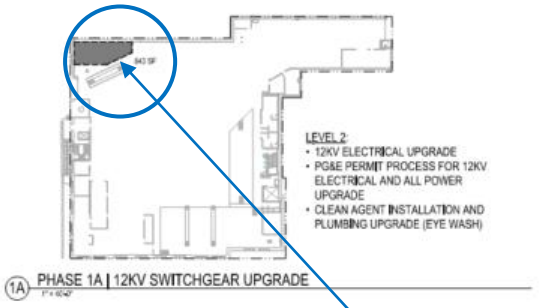
Exterior improvements:

See Appendix A7- Exterior Conditions Memo & A13 - Cost Estimate for details

Winding motors upgrade (optional):

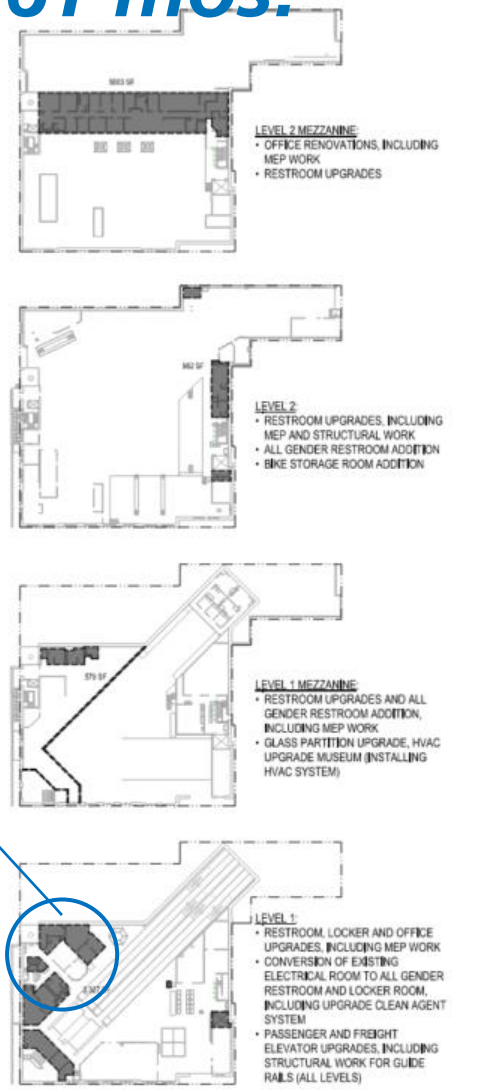
See Appendix A13 - Cost Estimate for details

Enabling Project



1A PHASE 1A | 12KV SWITCHGEAR UPGRADE

1B PHASE 1B | BRIDGE CRANE UPGRADE



2 PHASE 2 | OFFICE IMPROVEMENTS

Project Objectives

- **Electrical Modernization** – *replacement of main switchgear and electrical equipmt*
- **Accessibility Improvements** – *for SFMTA workplace and Public Visitors*
- **Seismic Retrofitting** – *make structurally safe & code compliant*
- **Exterior Rehabilitation** – *preserving Muni's crown jewel*
- **Improve Safety & Working Conditions** *for SFMTA Workforce*

Cable Machinery Winding Wheels, 1970
SFMTA Photo Archives M0817_1

Cable Car Barn Group Photo of Shop Staff, 2021
SFMTA Photo Archives 210819_CC_Barn_09_Comp

Standards for Rehabilitation

The Secretary of the Interior's Standards for Rehabilitation (36 CFR Part 67, 1990)
which are included in the Treatment Standards

The Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR Part 68, 1995) consists of four treatment standards—Preservation, Rehabilitation, Restoration, and Reconstruction—and are regulatory for NPS Grants–in–Aid programs.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values. The Rehabilitation Standards acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character.

U00778

SFMTA Photo Archives: Destroyed Washington and Mason Car House & Powerhouse After 1906 Earthquake and Fire, May 7, 1906

Electrical Modernization

Main driver of the **rehabilitation and upgrade work**

- Objective is to replace out of date and original equipment (1984)
- Existing equipment at lifecycle end – subject to increased fire hazard from panels and switchboards

Major Equipment Upgrades:

- Main Medium Voltage Service Entrance Switchgear
- Medium Voltage Transformer
- Low Voltage Switchboard
- AC and DC Electrical Panel
- Remote Terminal Units (RTU) and Supervised Control and Data Acquisition (SCADA)
- Transfer Switch and Emergency Generator Hookups

Medium Voltage Service Entrance Switchgear, 2.5 MW Medium Voltage Transformer and 480 V Switchboard

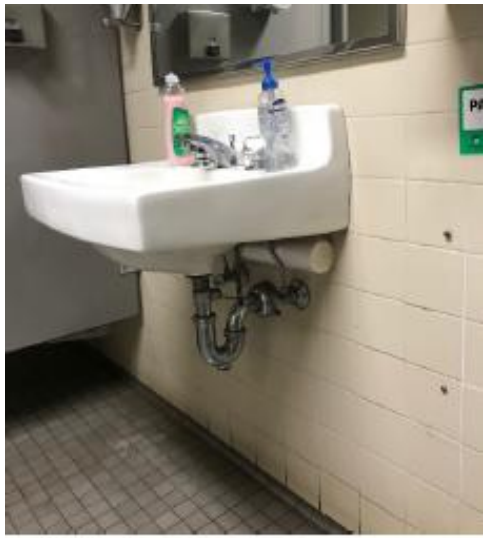
Motor Control Center (MCC)

Accessibility Improvements

Accessibility compliance and improvements required for Cable Car Barn work staff and Museum patrons:

- Path of Travel Widening
- Doorway Widening
- Restroom Accessory Replacement
- Wayfinding Signage
- Locker and Office Space Renovations
- Entrance Ramp and Landing Slope Softening
- Handrail Refurbishment

Non-compliant lavatory and shower (Men 203).



Non-compliant lavatory (Women 106).

Seismic Retrofitting

Initial Seismic Evaluation - Structural and Non-Structural Life Hazard Issues

Conceptual Seismic Improvements:

- South and east concrete wall strengthening
- Shear wall addition at the east side of the passenger elevator
- Shear wall addition for 2nd Fl wall reinforcement
- Stair bracing continuation next to the north wall
- Roof strengthening including existing diagonal brace upgrades and new braces
- Chimney separation through introduction of an expansion joint

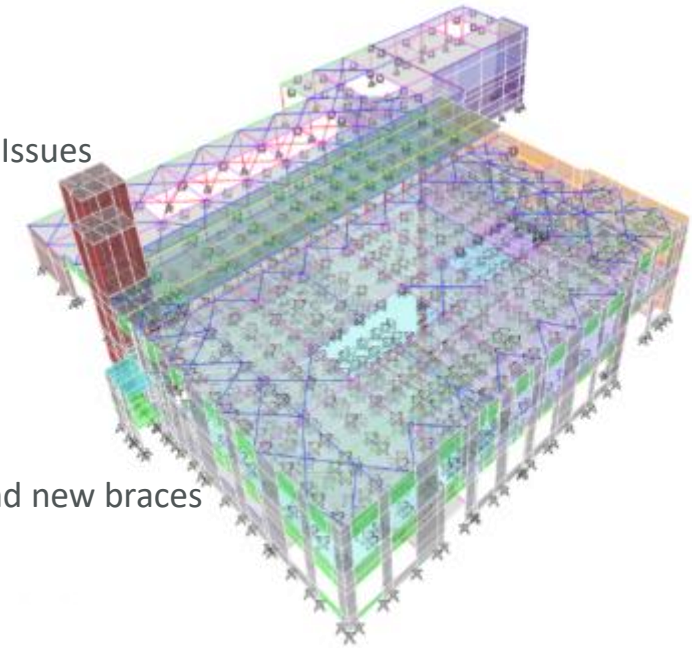
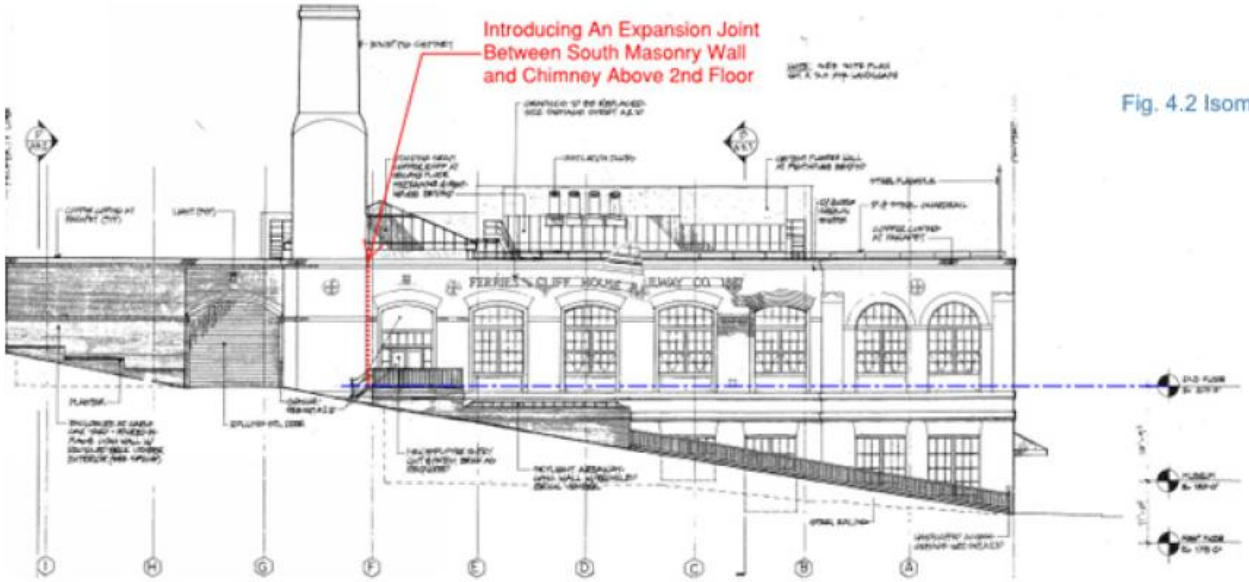


Fig. 4.2 Isometric 3D View of the ETABS Model



Chimney Separation

Exterior Rehabilitation

Brick Masonry

- Removal of general soiling, efflorescence, and stains
- Crack and spall repair
- Joints replacement
- Replace poorly matching masonry repairs and mortar joints for uniformity;
- Repair leaking pipes
- Repaint the brick masonry at the north lot line elevations
- Install sealant joints at the base of the building
- Repair metal parapet coping

Roof

- Replace roof membrane, insulation, drains, flashing
- Installation of equipment roof curbs
- Refinish skylight frames
- Replace sealant joints

Improve Safety & Working Conditions
for SFMTA Workforce and General Public

Major Work Scope
- 10-ton bridge crane to a 20-ton bridge crane with an extension
- Addition of a 3-ton free standing jib crane
- Addition of a 2-ton bridge crane
- Replacement of the passenger and freight elevators
- Replacement of the fire suppression system

Other Vital Work Scopes
- Upgrades to the heating, ventilation, and air conditioning (HVAC) system
- Upgrades to the weld room, inspection room, machine shop, carpentry area, paint booth, and assembly areas
- Installation of glass partitions for museum space
- Installation of EV chargers and shop compact storage units
- Addition of lactation room and bike storage room
- Additional facility electrical, plumbing, and structural work

Thank you!

Questions?

EP6 FC077 Cable Car Barn Rehabilitation 01-October-2024
CTA Prop L | Relative Level of Need or Urgency (Time Sensitive)
Supplemental Information: Attachment B3 (Excel Reference)

The historic Cable Car Barn (CCB) requires a variety of critical capital improvements that are needed to improve employee working conditions at the facility - including the CCB Museum, replace obsolete, critical electrical equipment, and modernize the electrical infrastructure of the cable car fleet. The recommendation of the Master Plan concluded that conversion to 12kV electrical power is the top priority at the facility after four decades in use since the 1984 major renovation.

All the electrical equipment, including the main medium voltage (MV) service entrance switchgear, medium voltage transformer, switchboards, motor control center, distribution panels, step-down transformers, sub-panels, and disconnect switches are mostly original components installed during the 1984 facility renovation. The equipment was made by Federal Pacific which is no longer in business. For example, if the main MV service entrance switchgear fails, there are no replacement parts.

Notwithstanding the parts replacement is the electrical safety condition due to the obsolescence of the switchgear having reached the end of its useful life which typically is 25-30 years of service. Additionally, the clearance requirements per NEC and CBC Electrical Code and the lack of an automatic transfer switch are non-compliant to current standards. The new equipment configurations and new electrical room location will resolve compliance with the Code and hazards to worker safety conditions.

The level of need and urgency is critical. The electrical equipment replacement and new electrical room along with all associated work including the new dual, separate PG&E electrical feeders are a priority to the SFMTA. While the cable cars generate revenue for the SFMTA, continuity and service resiliency of operations have a significant impact to the City. Cable Cars are iconic to San Francisco and play a significant role in the City's tourism industry.

City Charter, Sec. 8A.114. CABLE CARS - City Charter Amendment from 1971, requires SFMTA to maintain and operate the 59 Powell-Mason, 60 Powell-Hyde and 61 California, SF's three cable car lines, at normal levels of scheduling and service in perpetuity.

The funding needed for Phase 1A – critical project component: 12kV Switchgear Upgrade estimated in the July 2022 Master Plan based on a Phased Premium was $7,582,000 in hard costs and escalated to the mid-point of Construction. This excluded soft costs, and operations & maintenance (O&M) costs. It should be noted this estimated construction cost is subject to change in addition to the PG&E engineering and its construction cost of the feeder service infrastructure to the CCB.

Cable Car Barn Rehabilitation project requires funding to perform the environmental work for CEQA and NEPA clearance. Obtaining environmental clearance provides project preparedness to pursue new funding avenues and advancing design phases. SFMTA has selected As-Needed Environmental Consultants who can perform this work. However, funding for this professional services contract is required before a contract can be awarded.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Kirkland Yard Electrification		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The Kirkland Yard Electrification project will renovate and upgrade the Kirkland bus maintenance facility/yard to support the deployment of ~110 40-foot battery-electric buses by early 2029 as part of SFMTA's overall sustainable transportation plan. This request will fund SFMTA staff labor to supplement PG&E design engineering for the electrical distribution infrastructure from its power substation to the Kirkland Yard. This PG&E work is required for converting Kirkland to support a battery-electric fleet, whether done in full or through a phased approach.		
Project Location and Limits:	Kirkland Bus Yard is located located at 2301 Stockton Street and 151 Beach Street in the Fisherman's Wharf area adjacent to Pier 39. The site is bounded by Beach Street (to the north), Stockton Street (on its east), North Point Street (to the south) and Powell Street (to its west).		
Supervisorial District(s):	Citywide, District 3		
Is the project located on the 2022 Vision Zero High Injury Network ?	No	**Is the project located in an Equity Priority Community (EPC)?**	No
Which EPC(s) is the project located in?	N/A		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	Prop L funds will be used for SFMTA staff labor and the PG&E design work to provide the primary electrical service to Kirkland Yard. Funds will be used to produce construction documents for the electrical distribution from the utility provider's substation to the Kirkland site at 2301 Stockton Street.The project is part of SFMTA Strategic Plan to meet its goal to eliminate pollution and greenhouse gas emissions by moving away from diesel-hybrid buses and adopting zero emissions buses for Kirkland Facility. The project also meets another Strategic Plan goal by modernizing an aging facility which has outlived its intended useful life cycle and optimizing the Kirkland bus fleet with BEBs as well as facility infrastructure including the physical environment for its workforce of mechanics, operators, superintendents, and facility staff. The purpose of this project also is to meet the CARB (California Air Resource Board) Innovative Clean Transit (ICT) regulation to operate 100% zero transmission buses by 2040 and comply with the intent of the CARB ICT bus procurement requirements. To expedite the design and construction of Kirkland Yard Electrification Project, SFMTA has elected to issue a Progressive Design Build (PDB) Contract for project delivery by early 2029. For additional information, see attached Detailed Scope document.		
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Attachment 1: Detailed Scope Attachment 2: Kirkland Project Information (presentation) Attachment 3: SFMTA Battery Electric Bus Roll-Out Plan, July 2022; SFMTA Zero Emission Transition Plan, May 2022 Available on request: Pre-Development Report (PDR), April 2023		
Type of Environmental Clearance Required:	Categorically Exempt		
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	SF Public Utility Commission (PUC) - water, sewer, electrical & stormwater management ordinance; SF Port Waterfront Resiliency (Tim Doherty, SFMTA liaison); Pacific Gas & Electric (PG&E); SFMTA Environmental Review Team; SF Planning Department; NEPA Region 9		

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	100%	In-house and Contracted	Q2-Oct-Nov-Dec	2021/22	Q1-Jul-Aug-Sep	2023/24
Environmental Studies (PA&ED)	50%	Contracted	Q4-Apr-May-Jun	2023/24	Q2-Oct-Nov-Dec	2025/26
Right of Way						
Design Engineering (PS&E)	0%	Contracted	Q4-Apr-May-Jun	2024/25	Q4-Apr-May-Jun	2025/26
Advertise Construction	0%	In-house	Q2-Oct-Nov-Dec	2025/26		
Start Construction (e.g. Award Contract)	0%	Contracted	Q4-Apr-May-Jun	2025/26		
Operations (i.e. paratransit)						
Open for Use					Q2-Oct-Nov-Dec	2028/29
Project Completion (means last eligible expenditure)					Q4-Apr-May-Jun	2028/29

Notes

Board of Supervisors contract approval anticipated Fall 2025.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Kirkland Yard Electrification

Project Cost Estimate		**Funding Source**			
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**	
Planning/Conceptual Engineering	$ 9,189,498		$9,189,498	Actuals w/Forecast	* $1,073,196 of Other is Prop K sales tax
Environmental Studies (PA&ED)	$ -				
Right of Way	$ -				
Design Engineering (PS&E)	$ 5,496,000	$5,496,000		Engineer's estimate	
Construction	$ 142,868,127		$142,868,127	Engineer's estimate	
Operations (i.e. paratransit)	$ -				
Total Project Cost	$ 157,553,625	$ 5,496,000	$ 152,057,625		
Percent of Total		**3%**	**97%**		Including Prop K, sales tax is 4% of the total

Funding Plan - All Phases - All Sources						**Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)**				
Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
SB1 SGR		Planning/Conceptual Engineering	Allocated	2022/23	$ 318,225	$ -	$ -	$ -	$ -	$ -
Prop K		Planning/Conceptual Engineering	Allocated	2022/23	$ 1,073,196	$ -	$ -	$ -	$ -	$ -
RM3		Planning/Conceptual Engineering	Allocated	2023/24	$ 3,815,000	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Planning/Conceptual Engineering	Programmed	2024/25	$ 1,288,769	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Design Engineering (PS&E)	Planned	2024/25	$ 5,496,000	$ -	$ -	$ 2,748,000	$ 2,748,000	$ -
RM3		Planning/Conceptual Engineering	Allocated	2024/25	$ 2,694,308	$ -	$ -			$ -
RM3		Construction	Programmed	2025/26	$ 17,392,692	$ -	$ -	$ -	$ -	$ -
TBD (e.g., SB1 SGR and Prop B/General Fund)		Construction	Planned	2025/26	$ 26,537,853	$ -	$ -	$ -	$ -	$ -
Developer Fees		Construction	Programmed	2025/26	$ 688,137	$ -	$ -	$ -	$ -	$ -
General Fund Prop B Transit		Construction	Programmed	2025/26	$ 6,135,026	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Construction	Programmed	2025/26	$ 9,552,148	$ -	$ -	$ -	$ -	$ -
FTA TCP		Construction	Planned	2026/27	$ 6,312,271	$ -	$ -	$ -	$ -	$ -
General Fund Prop B Transit		Construction	Programmed	2026/27	$ 4,863,503	$ -	$ -	$ -	$ -	$ -
Low Carbon Fuel Standard (LCFS)		Construction	Programmed	2026/27	$ 503,155	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Construction	Programmed	2026/27	$ 5,098,805	$ -	$ -	$ -	$ -	$ -
TBD (e.g., TCP, TSF, GO Bond)		Construction	Planned	2026/27	$ 60,000,000	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Construction	Programmed	2027/28	$ 1,387,214	$ -	$ -	$ -	$ -	$ -
General Fund Prop B Transit		Construction	Programmed	2027/28	$ 4,397,323	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 157,553,625**	**$ -**	**$ -**	**$ 2,748,000**	**$ 2,748,000**	**$ -**

Notes

Advertising construction by December 2025 would require a significant lift on the funding side to secure $92.8 million in TBD planned funds in that time frame. We will continue to work with SFMTA to better understand and refine the funding plan, including tracking the likelihood, size, and contents of a GO Bond in 2026 and the near term capacity available in the Federal Transit Capital Priorities (TCP) formula funds process administered by the Metropolitan Transportation Commission. These sources are oversubscribed with many competing priorities even within SFMTA's own porfolio. We will support SFMTA's efforts to secure state and federal discretionary funds, as well.

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Kirkland Yard Electrification***
Relative Level of Need or Urgency (time sensitive)	In accordance with the California Air Resource Board's (CARB) Innovative Clean Transit regulation (ICT regulation), the following report serves as the San Francisco Municipal Transportation Agency's (SFMTA) Rollout Plan to transition its bus fleet to 100% zero-emission (ZE) by 2040. Effective October 1, 2019, the ICT regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size. ICT regulation does not apply to overhead catenary trolley buses (ZETB), but they are a part of zero-emission vehicles. To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies, to submit a ZEB Rollout Plan before purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components and must be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to CARB. According to the ICT regulation, each agency's requirements are based on its classification as either a "Large" or "Small" transit agency. The SFMTA, as a Large Transit Agency must comply with the following requirements: July 1, 2020 – Board of Directors (Board) approved Rollout Plan must be submitted to CARB January 1, 2023 – 25% of all new bus purchases must be ZE January 1, 2026 – 50% of all new bus purchases must be ZE January 1, 2029 – 100% of all new bus purchases must be ZE January 1, 2040 – 100% of fleet must be ZE March 2021 – March 2050: Annual compliance report due to CARB
	Due to the impacts of COVID-19, the SFMTA requested and was granted an extension for the submission of the Rollout Plan to March 31, 2021. The purpose of this request was to ensure that critical items such as the SFMTA's direction and decisions on trolley buses, yard rebuilds, stakeholder engagement, and future funding were included in the analysis to define the framework of its ZEB transition more accurately. The SFMTA will renovate the Kirkland Bus Yard (Kirkland) to accommodate approx. 110 40 ft battery electric buses (BEBs), a critical step on the way to electrifying our entire fleet of over 900 buses. Kirkland is a functionally and physically deficient 70-year-old facility that currently houses (88) 40 ft diesel-hybrid buses. Kirkland Yard will now become the first SFMTA facility to be converted to a BEB electrified facility. Previously, in SFMTA's Facility Framework Plan (2017), Kirkland was to follow Potrero Yard Modernization Project. Due to schedule and fiscal factors, the bus facility electrification conversion has prioritized Kirkland to be constructed first as well as to accommodate more than the originally planned 91 BEBs. This project will include the installation of overhead and ground mounted charging equipment as well as replacing existing operations buildings with additional parking for BEBs. The relative need and urgency is high. The BEB procurement is underway for the initial purchases of vehicles to comply with the 25% target. Very much related to the vehicle is the conversion of bus facilities such as Kirkland Yard to be ready by end of 2028 to charge and store a fleet of BEB's as the SFMTA fleet is replacing its diesel hybrid buses.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	Due to lack of major investments at Kirkland Yard over the years, the level of community engagement has been limited and had no purpose to initiate outreach as a consequence. As a good neighbor, SFMTA has distributed notices to the community in an effort to inform the neighboring constituency of activities out of the norm. With respect to an SFMTA engagement responsibility, the Muni Service Equity Strategy uses a methodology of criteria to prioritize transit improvements to neighborhoods with concentrations of: low-income households, affordable or public housing developments, minority residents, and low ratios of car ownership. The resulting Equity Neighborhoods are accounted for in service prioritization and decision-making as well as capital planning efforts. Three out of the five bus routes served by the Kirkland Bus Yard (12 Folsom, 19 Polk, 43 Masonic) are identified as Muni Equity Routes in SFMTA's Muni Service Equity Strategy. These routes serve 28 overburdened and underserved census tracts identified in the CJEST including the neighborhood surrounding the yard in Fisherman's Wharf. Other areas supported by Kirkland include the following Equity Neighborhoods: Inner Mission, SoMa-Tenderloin, and Excelsior-Outer Mission. Rehabilitating Kirkland Yard for electric buses would improve air quality and noise across the city.
Benefits to Disadvantaged Populations and Equity Priority Communities	SFMTA is procuring the battery electric buses (BEBs) under a separate procurement contract (non-facilities). The procurement of BEBs requires Kirkland Bus Yard & Facility to be upgraded for the electriification of the new incoming bus fleet that is replacing the existing diesel hybrid buses. The new BEBs benefits the disadvantaged populations by improving bus vehicles and reducing greenhouse gas (GHG) emissions on the City's roads. The new BEBs will incorporate improvements for accessibility on-board and accessing the vehicles. Additionally, SFMTA's BEB Program will introduce new apprenticeship programs and hiring for technical training and jobs to operate and maintain this new vehicle type. For additional information, see attached Detailed Scope document. Kirkland Yard in its location in the Fisherman's Wharf area of San Francisco is not located in the Equity Priority Community (EPC). The neighborhood has some of the highest levels of PM2.5 in the nation (93rd PCTL), high traffic volumes (93rd PCTL) and is overburdened by legacy pollution. The project will allow SFMTA to replace polluting diesel buses with zero-emission buses in support of our Climate Action Plan, dramatically reducing pollution in the community.
Compatability with Land Use, Design Standards, and Planned Growth	Yes

San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Economic Vitality, Safety and Livability
	The conversion of Kirkland Bus Yard from a facility housing diesel hybrid buses (of approximately 88) to an all-battery electric bus (BEB) fleet of approx. 110 BEBs provide Muni zero emissions into the neighborhoods of the 17 routes serviced. The investment priority identified in SFTP 2050 advances economic vitality, transportation projects and Employment Training programs to provide employment opportunities benefitting disadvantaged individuals, more efficient transit and cleaner air. Vehicle miles traveled by the BEBs will be electrified helping cut greenhouse gases (GHG).
The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The Kirkland facility is severely inadequate for maintaining and servicing modern transit buses in a safe and efficient manner. With only three limited indoor maintenance bays, one exterior maintenance bay is located outside and uncovered by yard staff as a workaround until improvements are made. The existing Kirkland Yard, unchanged since its inception, has deficient and crowded facilities, increases opportunities for operators and mechanics to potentially unsafe conditions. A rehabilitated facility will improve safety for workers, but will also improve safety for the neighborhood. Kirkland is located in a low-income neighborhood that faces especially high risks from diesel emission pollution as well as traffic impacts, which can lead to risks of stroke, heart disease, and asthma, among other concerns. Converting the current hybrid diesel fleet maintained at Kirkland to BEBs will reduce risks for this community, as well as the communities traversed by the bus routes the facility supports. The imperative predecessor work to achieving this project purpose requires updating the primary (12kV) service by PG&E delivered to SFMTA's Kirkland Yard
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	A rehabilitated Kirkland Yard with PG&E essential primary (12kV) electrical service upgrades will enable the Yard to make the facility conversion to a full battery electric bus (BEB) Zero Emission Bus facility. This will allow the agency to improve service delivery, efficiency, and safety for at least another 30 to 40 years. The new electrical infrastructure investment will go a long ways to kickstarting upgraded facilities on-site: improving the maintenance bays and replacing the existing bus wash, hence reducing down time due to out of date machinery or equipment and maintenance delays due to maintenance bays being unavailable in inclement weather. This will increase efficiency of the facility while improving service reliability systemwide. The overall result will reset the SFMTA's asset useful life at Kirkland Yard.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	The rehabilitation and reconfiguration of the Kirkland Yard and the purchase and installation of EV equipment and infrastructure will improve efficiency of the transit operations. The essential primary (12kV) electrical upgrade will support fleet expansion and service improvements. Investment in Kirkland Yard will improve service levels and environmental outcomes while providing Muni with clean and reliable vehicles to operate in revenue service. A key component of the SFMTA's Muni Forward Program, in addition to improved service levels, reliability and speed, is the implementation of the Muni Rapid Network. The Muni Rapid Network prioritizes frequency and reliability on the Muni transit system's most heavily used routes. The expansion of the bus fleet also increases Muni's ability and use of bus bridging from Kirkland to augment service to meet extraordinary demands caused by peak events such as music festivals in Golden Gate Park, events at the Chase Center, Blue Angels, 4th of July, Super Bowl, Olympics, etc.

ATTACHMENT 1

Prop L | Scope & Schedule
EP6 FC111 **Kirkland Yard Electrification**
Date: 13-February-2025, REV00

B14: **Detailed Scope**

The project is part of SFMTA Strategic Plan to meet its goal to eliminate pollution and greenhouse gas emissions by moving away from diesel-hybrid buses and adopting zero emissions buses for Kirkland Facility. The design work in this fund request allocation is prepare the 'bridging' documents in preparation for the RFPQ (request for qualifications/proposals) to procure the services of a Progressive Design Build contractor for the construction of the complete yard electrification.

PG&E Design Work
The design work involved in this funding request is for the engineering design of the electrical distribution infrastructure and construction documents that will be performed by the electrical utility provider, PG&E, from their power substation to the Kirkland Yard project site at 2301 Stockton Street. Kirkland present day is obsolete not only in its facility quarters, but also in its electrical system. To electrify approx. eighty-eight (88) battery electric buses (BEB), the requested new service applications (i.e. load request) have been submitted to PG&E.

The planning of the power distribution route through the city will be identified in PG&E's System Impact Statement Report. This leads to another PG&E Facility Study Report before the Advanced Design & Preliminary (ADP) design commences. All this is outlined in the PG&E Wholesale Distribution Tariff, Rev. 3 (WDT3) application through design and construction work flow. PG&E's design work is essential to upgrading the power delivery to the Kirkland Yard facilities and for the BEB charging infrastructure. SFMTA staff labor will supplement the PG&E engineering design with clarification to design and site plans to the utility provider.

The PG&E work is required for the full conversion of Kirkland. It will also be needed if there is a phased approach to electrification of Kirkland Yard. To expedite the design and construction of Kirkland Yard Electrification Project, SFMTA has elected to issue a Progressive Design Build (PDB) Contract for project delivery by early 2029.

SFMTA Strategic Plan Goal
The project also meets another SFMTA Strategic Plan goal by modernizing an aging facility which has outlived its intended useful life cycle and optimizing the Kirkland bus fleet with BEBs as well as facility infrastructure including the physical environment for its workforce of mechanics, operators, superintendents, and facility staff. The purpose of this project also is to meet the CARB (California Air Resource Board) Innovative Clean Transit (ICT) regulation to operate 100% zero transmission buses by 2040 and comply with the intent of the CARB ICT bus procurement requirements.

The importance of Kirkland Bus Yard is the ability of accepting new BEB's and electric vehicle (EV) charging facilities by SFMTA to its fleet by Y2027. Y2027 is the target for first arrival of Battery-electric buses (BEB) to be received by SFMTA and placed into revenue service in late Y2028. Kirkland Yard is on the critical path to retrofit the facility with electric vehicle (EV)

charging infrastructure to have the BEB buses operational in the fleet. Kirkland will employ the overhead pantograph charging type system in a depot fleet charging and bus (stacking) storage configuration.

Public Outreach & Engagement
SFMTA has launched a project website for the Kirkland Yard Electrification Project as part of its commitment to public outreach and engagement. The website can be found here: https://www.sfmta.com/projects/kirkland-yard-electrification-project. Additional information will be continually provided by SFMTA Public Outreach and Engagement Team (POET) to external stakeholders with the inception of the design and through construction.

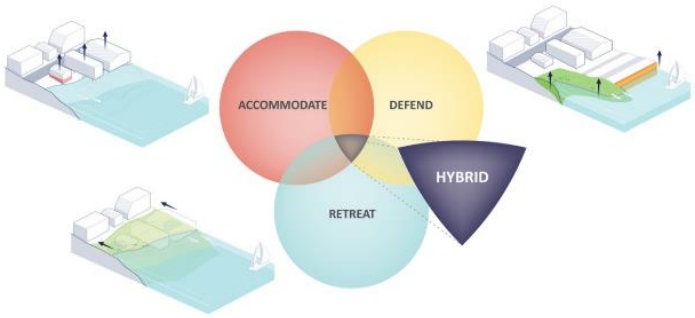
Other Key Issues
Kirkland Facility is situated in the Sea Level Rise Vulnerability Zone. Under the Port of San Francisco Resilient Program, the Port in partnership with SFMTA, U.S. Army Corps of Engineers, and other City agencies are developing a Draft Waterfront Adaptation Plan. SF Port released the Draft Waterfront Adaptation Plan, January 2024 referenced now as the San Francisco Waterfront Flood Study (Flood Study). See link to the Draft Report: https://www.sfport.com/wrp/draft-report It is in public comment review phase. The plan will identify a preferred approach to reduce flood risks from sea level rise and extreme storms. Possible strategies in the plan could include raising the shoreline along roadways such as Embarcadero to address up to 7-feet of sea level rise expected 2100. Refer to the SF Port link for more information: https://sfport.com/wrp

These issues require a broader collaboration with the Port of San Francisco Resiliency Program. It requires a coordinated mitigation plan that is long in developing, hence the current plan is for this to be addressed when the Kirkland Facility is scheduled to be entirely re-built after 2040. Workshops are underway between the SFMTA and Port agencies in the discussion of the proposed strategies. The impact to Kirkland is indeterminant in the near-term, hence there is no impact to the project. The long term impact to Kirkland will be better understood when the Resiliency Program is adopted and will have far reaching not only to SFMTA's Kirkland Yard but all along the Embarcadero waterfront through Pier 39 and Fisherman's Wharf.

Kirkland Yard being the first yard facility to receive BEBs will advance through construction. Any modification to the yard or implementation of the sea level rise mitigation measures will be considered with the City's adoption of the Resiliency Program. The lines of defense (LOD) that have been discussed include the following:

- **LOD E**: Defend
- **LOD F**: Accommodate
- **LOD G**: Retreat

Vignette of LOD E (Defend), F (Accommodate) and G (Retreat):



High-Level Draft Waterfront Adaptation Strategies

Conclusion

The planned SFCTA funds will go towards the Design Engineering (PS&E) and Construction of the Kirkland Yard Electrification Project at 2301 Stockton Street. SFMTA staff labor will supplement the PG&E engineering design with technical clarifications, engineering design documentation and site plans to the utility provider.

The PG&E work is required for the full conversion of Kirkland. It will also be needed if there is an alternative phased approach to electrification of Kirkland Yard due to funding considerations.

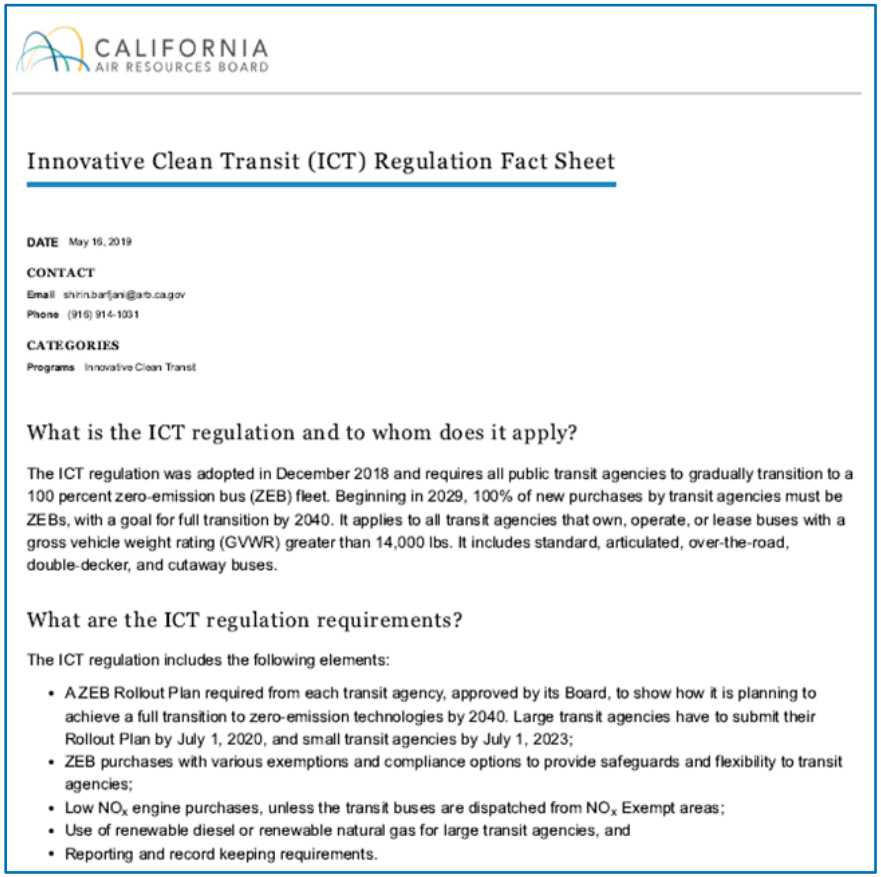
In either project approach, the PG&E service is essential. SFMTA has elected to issue a Progressive Design Build (PDB) Contract for project delivery for electrification at Kirkland Yard.

ATTACHMENT 2

Kirkland Yard
Preparation of Bridging Documents

Project Purpose

- Upgrade Kirkland Yard to store, maintain and charge **(91) 40-foot BEBs**.
- Meet the CARB Innovative Clean Transit (ICT) regulation to operate **100% zero emission buses (ZEB) by 2040**,
- Comply with the intent of the **CARB ICT bus procurement requirements**.
  - Starting 2023: 25% of new buses purchased must be ZEBs
  - Starting 2026: 50% of new buses purchased must be ZEBs
  - Starting 2029: 100% of new buses purchased must be ZEBs
- **SFMTA's Zero-Emission Bus Rollout Plan**:
  - **City's Climate Action Strategy** goals,
  - **Eliminating San Francisco's carbon footprint**,
  - **SFMTA's transit fleet more sustainable**, and
  - **Supports the City's voter-approved Transit-First Policy** – *established in 1973*.
- **SFMTA has a *self-imposed goal by 2035*** to operate all 100% zero greenhouse gas (GHG) emission buses - ***which is earlier than the CARB 2040 date***.



CALIFORNIA AIR RESOURCES BOARD

Innovative Clean Transit (ICT) Regulation Fact Sheet

DATE May 16, 2019

CONTACT

Email shirin.barjan@arb.ca.gov

Phone (916) 914-1031

CATEGORIES

Programs Innovative Clean Transit

What is the ICT regulation and to whom does it apply?

The ICT regulation was adopted in December 2018 and requires all public transit agencies to gradually transition to a 100 percent zero-emission bus (ZEB) fleet. Beginning in 2029, 100% of new purchases by transit agencies must be ZEBs, with a goal for full transition by 2040. It applies to all transit agencies that own, operate, or lease buses with a gross vehicle weight rating (GVWR) greater than 14,000 lbs. It includes standard, articulated, over-the-road, double-decker, and cutaway buses.

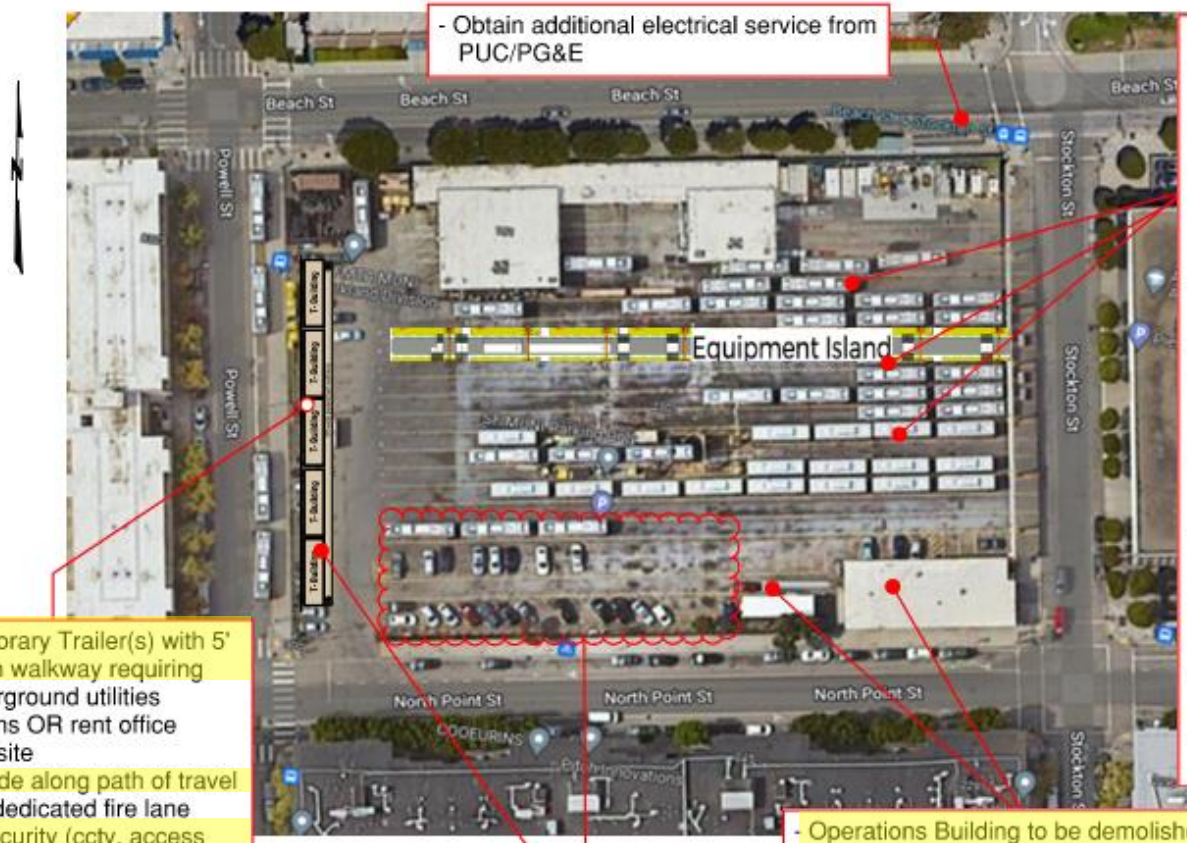
What are the ICT regulation requirements?

The ICT regulation includes the following elements:

- A ZEB Rollout Plan required from each transit agency, approved by its Board, to show how it is planning to achieve a full transition to zero-emission technologies by 2040. Large transit agencies have to submit their Rollout Plan by July 1, 2020, and small transit agencies by July 1, 2023;
- ZEB purchases with various exemptions and compliance options to provide safeguards and flexibility to transit agencies;
- Low NO_x engine purchases, unless the transit buses are dispatched from NO_x Exempt areas;
- Use of renewable diesel or renewable natural gas for large transit agencies, and
- Reporting and record keeping requirements.

Kirkland Yard – the Facility Today

Kirkland Yard: Facility Upgrade Scope-of-Work



- Obtain additional electrical service from PUC/PG&E

- Repave yard
- Increase bus lane width from 11' to 12' wide
- New striping, signage, and regrading
- Install Equipment Island containing 46 DC charging cabinets, switch gear and transformers
- Install overhead pantograph support gantries
- New geotechnical report
- New fence along Stockton Street to accommodate wider lanes
- Shallow groundwater and potentially contaminated soil and groundwater
- Evaluate bus turning radius in yard
- May need provide hose bibb, compressed air and electric outlet to yard
- New power distribution and lighting
- Address flood control and storm water drainage

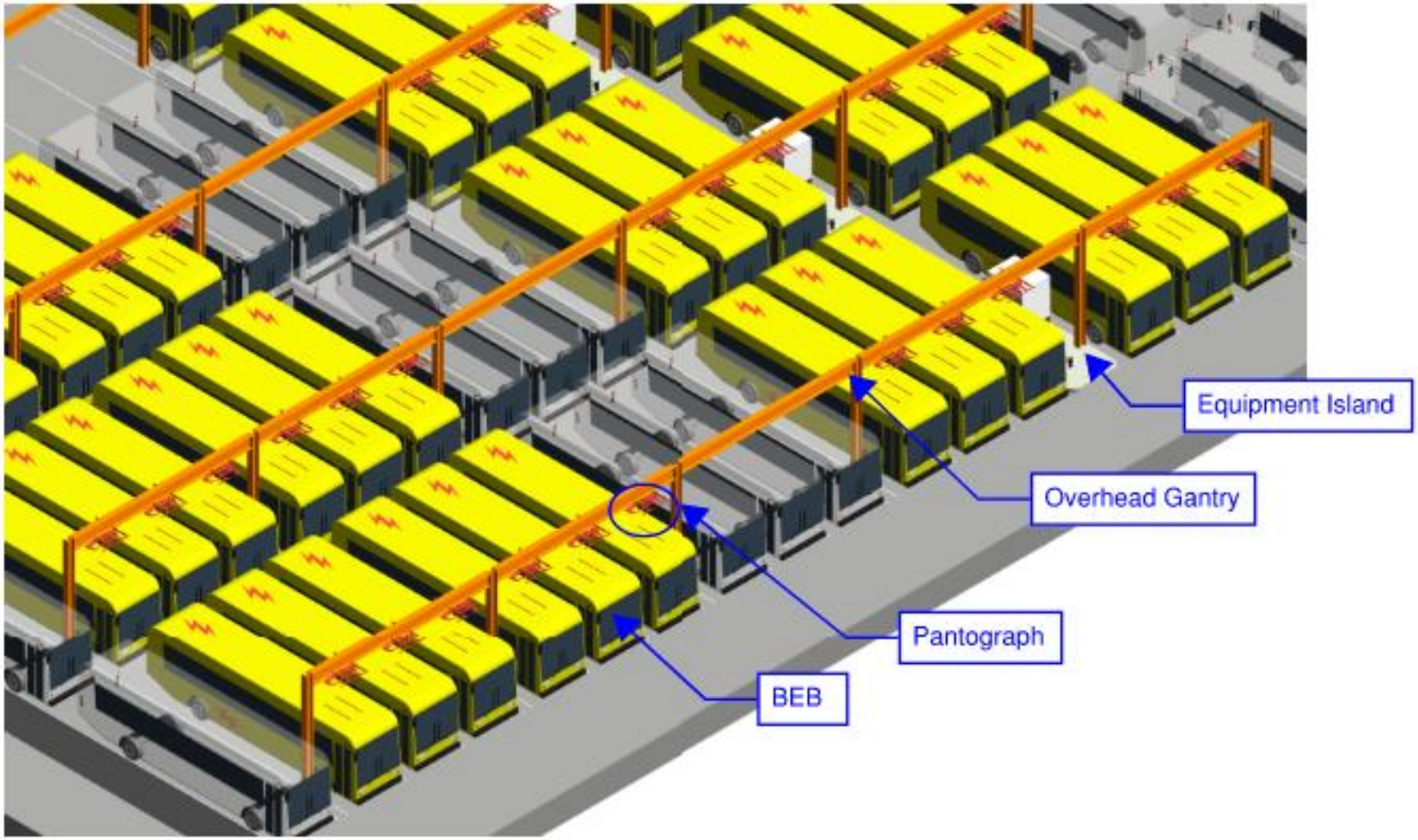
- New Temporary Trailer(s) with 5' pedestrian walkway requiring new underground utilities connections OR rent office space off site
- ADA upgrade along path of travel
- May need dedicated fire lane
- Address security (cctv, access control, intercom) and communication/IT requirements
- Upgrade fire alarm and fire suppression upgrade to facility
- SF Art Commission requires 2% of construction goes to artwork
- LEED requirements may apply

Eliminated Employee Parking

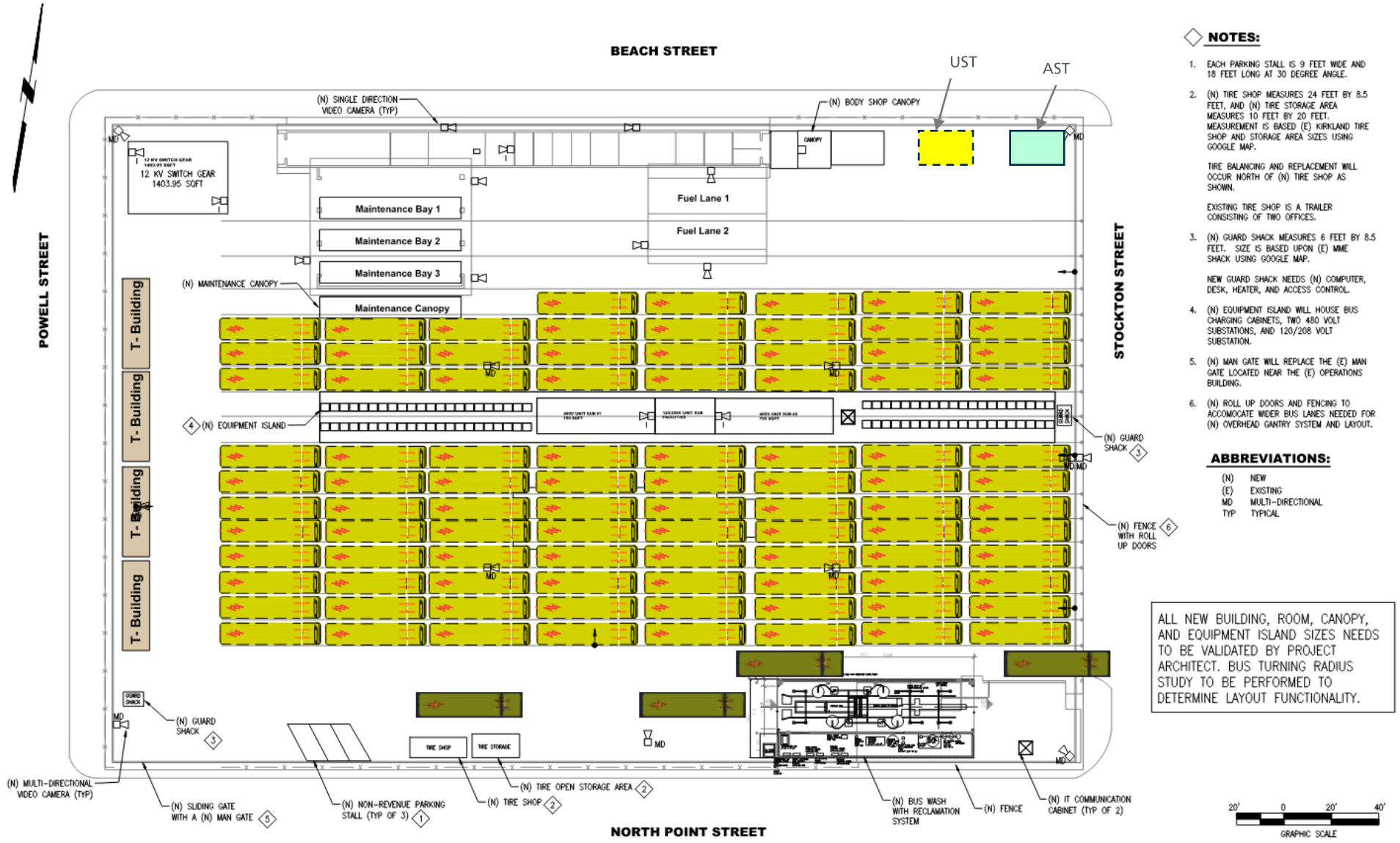
- Operations Building to be demolished
- Remove Existing Trailer
- Repave Area
- New Fence work and sidewalk work at location of removed/demolished buildings
- Remove/cap utilities serving the buildings

Kirkland Yard: Components of the Upgrade

Depot Charging Elements



Potential Layout



NOTES:

1. EACH PARKING STALL IS 9 FEET WIDE AND 18 FEET LONG AT 30 DEGREE ANGLE.
2. (N) TIRE SHOP MEASURES 24 FEET BY 8.5 FEET, AND (N) TIRE STORAGE AREA MEASURES 10 FEET BY 20 FEET. MEASUREMENT IS BASED (E) KIRKLAND TIRE SHOP AND STORAGE AREA SIZES USING GOOGLE MAP.

   TIRE BALANCING AND REPLACEMENT WILL OCCUR NORTH OF (N) TIRE SHOP AS SHOWN.

   EXISTING TIRE SHOP IS A TRAILER CONSISTING OF TWO OFFICES.
3. (N) GUARD SHACK MEASURES 6 FEET BY 8.5 FEET. SIZE IS BASED UPON (E) MME SHACK USING GOOGLE MAP.

   NEW GUARD SHACK NEEDS (N) COMPUTER, DESK, HEATER, AND ACCESS CONTROL.
4. (N) EQUIPMENT ISLAND WILL HOUSE BUS CHARGING CABINETS, TWO 480 VOLT SUBSTATIONS, AND 120/208 VOLT SUBSTATION.
5. (N) MAN GATE WILL REPLACE THE (E) MAN GATE LOCATED NEAR THE (E) OPERATIONS BUILDING.
6. (N) ROLL UP DOORS AND FENCING TO ACCOMOCATE WIDER BUS LANES NEEDED FOR (N) OVERHEAD GANTRY SYSTEM AND LAYOUT.

ABBREVIATIONS:

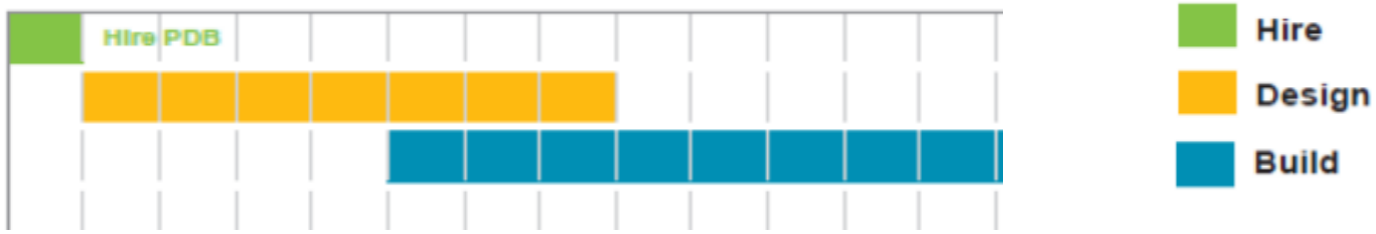
(N)	NEW
(E)	EXISTING
MD	MULTI-DIRECTIONAL
TYP	TYPICAL

ALL NEW BUILDING, ROOM, CANOPY, AND EQUIPMENT ISLAND SIZES NEEDS TO BE VALIDATED BY PROJECT ARCHITECT. BUS TURNING RADIUS STUDY TO BE PERFORMED TO DETERMINE LAYOUT FUNCTIONALITY.

20' 0 20' 40'
GRAPHIC SCALE

Progressive Design Build

Progressive Design Build



City Scope/Requirements

- SFPW Hydraulics – New sewer connections, sewer layout in yard, storm water management design in yard
- SFPW SAR (Site Assessment and Remediation) – *Handling hazardous materials and wastes along with soil sampling for Maher Ordinance*
- SFPUC – Stormwater Management Ordinance requirements
- SFPUC | CCD – Water Connection Design requirements
- **San Francisco Environment** - Green Halo requirements, **LEED/Envision**
- **By Others**: *via MTA's As-Needed Contract, partial list of specialized E/A services*
  - Surveying (Auriga/AECOM)
  - Landscape Architecture (Auriga/AECOM) – *coordinating bioswale requirements w/ SF Hydraulics*

ATTACHMENT 3

Zero-Emission Bus Rollout Plan

Prepared for:

CALIFORNIA AIR RESOURCES BOARD

Prepared By:

wsp

SFMTA

Rollout Plan Revision History			
Revision Number	**Editor**	**Date**	**Notes**
0	Bhavin Khatri	5/14/21	Final release
1	Ivan Magana	07/06/22	Edits to Fleet Procurement schedule and Facilities schedule

Table of Contents

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Acronyms & Abbreviations

BEB	Battery Electric Bus
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CNG	Compressed Natural Gas
DAC	Disadvantaged Community
DHEB	Diesel-Hybrid Electric Bus
FCEB	Fuel Cell Electric Bus
ICEB	Internal Combustion Engine Bus
ICT	Innovative Clean Transit
kW(h)	Kilowatt (hour)
MME	Muni Metro East
O&M	Operations & Maintenance
OCS	Overhead Catenary System
PG&E	Pacific Gas & Electric
RNG	Renewable Natural Gas
SMR	Steam-Methane Reform
SFPUC	San Francisco Public Utilities Commission
SFMTA	San Francisco Municipal Transportation Agency
FTA	Federal Transit Administration
WDT	Wholesale Distribution Tariff
ZE	Zero-Emission
ZEB	Zero-Emission Bus
ZETB	Zero-Emission Trolley Bus

1 Rollout Plan Summary

Agency Background	
Transit Agency's Name	San Francisco Municipal Transportation Agency
Mailing Address	1 S. Van Ness Avenue San Francisco, CA 94105
Transit Agency's Air District	Bay Area Air Quality Management District
Transit Agency's Air Basin	San Francisco
Total number of Buses in Annual Maximum Service	680[1]
Urbanized Area	San Francisco - Oakland
Population of Urbanized Area	3,557,982[2]
Contact information of general manager, chief operating officer, or equivalent	Jeffrey Tumlin Director of Transportation 415.646.2522 mailto:XXXXX@sfmta.comjeffrey.tumlin@sfmta.com
Rollout Plan Content	
Is your transit agency part of a Joint Group[3]	No
Is your transit agency submitting a separate Rollout Plan specific to your agency, or will one Rollout Plan be submitted for all participating members of the Joint Group?	N/A
Please provide a complete list of the transit agencies that are members of the Joint Group (optional)	N/A
Contact information of general manager, chief operating officer, or equivalent staff member for each participating transit agency member	N/A
Does Rollout Plan have a goal of full transition to ZE technology by 2040 that avoids early retirement of conventional transit buses?	Yes
Rollout Plan Development and Approval	
Rollout Plan's approval date	03-16-21
Resolution No.	210316-038
Is copy of Board-approved resolution attached to the Rollout Plan?	Yes (Appendix A)
Contact for Rollout Plan follow-up questions	Bhavin Khatri, PE, PMP Zero Emission Program Manager 415.646.2586 bhavin.khatri@sfmta.com
Who created the Rollout Plan?	Consultant
Consultant	WSP

[1] This is based on January 2020 (pre-COVID) service.
[2] ACS 2019 (https://censusreporter.org/profiles/40000US78904-san-francisco-oakland-ca-urbanized-area/)
[3] The ICT regulation defines a Joint ZEB Group or Joint Group (13 CCR § 2023.2) as two or more transit agencies that choose to form a group to comply collectively with the ZEB requirements of section 2023.1 of the ICT regulation.

2 Introduction

In accordance with the California Air Resource Board's (CARB) Innovative Clean Transit regulation (ICT regulation), the following report serves as the San Francisco Municipal Transportation Agency's (SFMTA) Rollout Plan to transition its bus fleet to 100% zero-emission (ZE) by 2040.

2.1 Background

2.1.1 California Air Resource Board's Innovative Clean Transit Regulation

Effective October 1, 2019, the ICT regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size.

ICT regulation does not apply to overhead catenary trolley buses (ZETB), but they are a part of zero-emission vehicles.

To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies, to submit a ZEB Rollout Plan before purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components and must be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to CARB.

According to the ICT regulation, each agency's requirements are based on its classification as either a "Large" or "Small" transit agency. The ICT defines a Large Transit Agency as an agency that operates in the South Coast or the San Joaquin Valley Air Basin and operates more than 65 buses in annual maximum service or it operates outside of these regions, but in an urbanized area with a population of at least 200,000 and has at least 100 buses in annual maximum service. A Small Transit Agency is an agency that doesn't meet the above criteria.

The SFMTA, as a Large Transit Agency must comply with the following requirements:

July 1, 2020 – Board of Directors (Board) approved Rollout Plan must be submitted to CARB

January 1, 2023 – 25% of all new bus purchases must be ZE

January 1, 2026 – 50% of all new bus purchases must be ZE

January 1, 2029 – 100% of all new bus purchases must be ZE

January 1, 2040 – 100% of fleet must be ZE

March 2021 – **March 2050** – Annual compliance report due to CARB

Due to the impacts of COVID-19, the SFMTA requested and was granted an extension for the submission of the Rollout Plan to March 31, 2021. The purpose of this request was to ensure that critical items such as the SFMTA's direction and decisions on trolley buses, yard rebuilds, stakeholder engagement, and future funding were included in the analysis to define the framework of its ZEB transition more accurately.

2.1.2 Zero-Emission Bus Technologies

According to the ICT regulation, a ZEB is a bus with zero tailpipe emissions and is either a BEB or a FCEB. The following subsections provide a brief overview of each technology and how they compare to ICEBs. While both BEB and FCEB technologies provide ZE benefits, the feasibility and viability of their application is largely based on an agency's service and operational parameters. The following provides a brief overview of BEB and FCEB technologies.

Battery-Electric Buses (BEBs)

BEBs use onboard batteries to store and distribute energy to power an electric motor and other onboard systems. Similar to many other battery-powered products, BEBs must be charged for a period of time to be operational.

BEB charging technology exists to charge vehicles at the yard (overnight or midday) or on-route (typically during layovers). A yard charging strategy typically consists of buses with high-capacity (kilowatt-hour or kWh) battery packs that are charged for four to eight hours with "slow" chargers - usually less than 100 kilowatts (kW) – while being stored overnight. An on-route charging strategy typically consists of buses with low-capacity battery packs that are charged with "fast" chargers – usually in excess of 100 kW – during bus layovers (typically 5-20 minutes). BEBs are charged via several dispenser types (conductive and inductive) and orientations (overhead or ground-mounted). The most common dispensers in the U.S. market are plug-in and pantographs, as presented in Figure 2-1.

Figure 2-1. Plug-In and Pantograph Charging

Sources: YorkMix (Left) and ABB (formerly ASEA Brown Boveri) (Right)

Under existing conditions, BEBs cannot meet the ranges that ICEBs can. BEBs typically have a range of 125-150 miles, which is highly dependent on a myriad of factors, including climate, driving behavior, and topography. For this reason, if an agency's service blocks cannot be completed with BEBs, other capital-intensive strategies may be needed to meet range requirements, including, but not limited to additional BEBs, on-route charging infrastructure, service changes, and/or a mixed-fleet strategy with the incorporation of FCEBs.

Fuel Cell Electric Buses (FCEBs)

FCEBs can typically replace ICEBs at a 1:1 replacement ratio without significant changes to operations and service. A FCEB uses hydrogen and oxygen to produce electricity through an electrochemical reaction to power the propulsion system and auxiliary equipment. This ZE process has only water vapor as a byproduct. The fuel cell is generally used in conjunction with a battery, which supplements the fuel cell's power during peak loads and stores electricity that is recaptured through regenerative braking, allowing for better fuel economy.

The process, operations, and equipment used to refuel hydrogen buses is similar to "lighter-than-air" fuels such as compressed natural gas (CNG). Typically, hydrogen is produced via steam-methane reform (SMR) or electrolysis. SMR, the most common method of producing hydrogen, uses high-pressure steam to produce hydrogen from a methane source, such as natural gas. Electrolysis, on the other hand, uses an electric current to decompose water into hydrogen and oxygen. After the hydrogen is produced, it can be delivered to the site via pipeline or delivered by a truck (as either a gas or liquid). Hydrogen is then stored, compressed, and dispensed to the buses on-site. Depending on space availability and resources, some agencies can produce hydrogen on-site.

Some of the most pressing challenges for FCEB operations is the limited supply network and the amount of energy, space, and high capital costs required to isolate, compress, and store hydrogen. Also, if renewable natural gas (RNG) - such as methane capture from organic matter – is not used as an alternative to natural gas via SMR operations, there are some concerns that FCEBs may not be the most sustainable vehicle to achieve GHG targets.

2.1.3 ZEB Suitability for the SFMTA's Service and Operations

The choice between adopting BEBs or FCEBs is contingent on the unique needs and conditions of an agency. Several variables need to be factored into this decision, including costs associated with bus acquisitions and associated infrastructure, spatial requirements, energy/fuel costs, and community acceptance. Based on existing conditions and the stated variables, BEBs appear to be the most suitable technology for the SFMTA to meet the requirements of the ICT regulation. The following provides a brief summary of the main findings of this analysis:

BEBs are more affordable than FCEBs at this time. There are barriers to entry for both BEBs and FCEBs, with both technologies exceeding the cost ICEBs. However, BEBs have achieved better economies of scale and are currently significantly less expensive than FCEBs.

The SFMTA's bus facilities are too space-constrained to accommodate FCEB-supporting infrastructure. Infrastructure to support BEBs (charging cabinets, dispensers, and associated utility equipment) can all be contained within the SFMTA's yard (either elevated or ground-mounted). In contrast, the infrastructure required for FCEBs (storage tanks, dispensers, etc.) requires a large footprint due to sizing and the National Fire Protection Association's (NFPA) required buffers. For example, a 15,000-gallon vertical hydrogen storage tank has a footprint of approximately 40 by 50 feet (not including the fueling island). This same tank would need to be located at least 75 feet from all air intakes, 50 feet from liquid or gas lines, and at least 25 feet from public ways, railroads, and property lines due to NFPA requirements. With the SFMTA's yards already being space-constrained in an urban environment, the SFMTA would risk losing a lot of potential bus parking – assuming that the infrastructure complies with NFPA requirements.

The SFMTA's existing rates for electricity are very competitive. With exceptionally low energy costs, powering BEBs is expected to be significantly less expensive than supplying hydrogen via liquid delivery. Hydrogen costs currently average around $8/kg and can have wide variability depending on local production supply and distance from the chosen supplier.

Hydrogen operations in the SF's dense neighborhoods may be a barrier to public acceptance. BEBs are widely accepted by communities and supported in terms of sustainability initiatives by both cities and transit agencies alike. This is in large part due to near or zero local emissions and quiet operations. Communities are generally more cautious with the installation of hydrogen storage near their community due to the risk of hydrogen seepage and combustion. When located near urban or residential areas, significant stakeholder outreach is often required to garner support for on-site hydrogen storage. With the majority of the SFMTA's yards located in urban regions, adoption of hydrogen may result in community pushback and potential delays in rollout.

2.1.4 San Francisco Municipal Transportation Agency

The SFMTA is a department of the City and County of San Francisco. The SFMTA plans and operates bus, rail, historic streetcar, cable car, and paratransit transit service within the City and County of San Francisco. In addition, the SFMTA also manages parking, traffic, bicycling, walking, and taxis in the city. Prior to the COVID-19 pandemic, the SFMTA provided approximately 726,000 weekday and 220 million annual passenger boardings.[4] 71% of these boardings — 520,000 per weekday and over 156 million annually — occurred on 76 weekday bus routes. Ridership from 654,300 weekday boardings in FY06 to 726,100 in FY16.[5]

Service Area

The SFMTA serves approximately 49 square miles within the City and County of San Francisco (Figure 2-2). San Francisco has added over 78,000 residents and over 175,000 jobs since 2009, and now has a population of 883,000 and 720,000 total jobs.[6]

Utility Provider

The San Francisco Public Utilities Commission (SFPUC) provides electrical service for the SFMTA service area by way of Pacific Gas & Electric (PG&E) electrical infrastructure. The SFPUC operates Hetch Hetchy Power, a Publicly Owned Utility. Although the SFPUC has served all municipal agencies within the City and County of San Francisco for many decades, it relies upon PG&E's transmission and distribution grid to serve its customers, for which PG&E receives a fee.

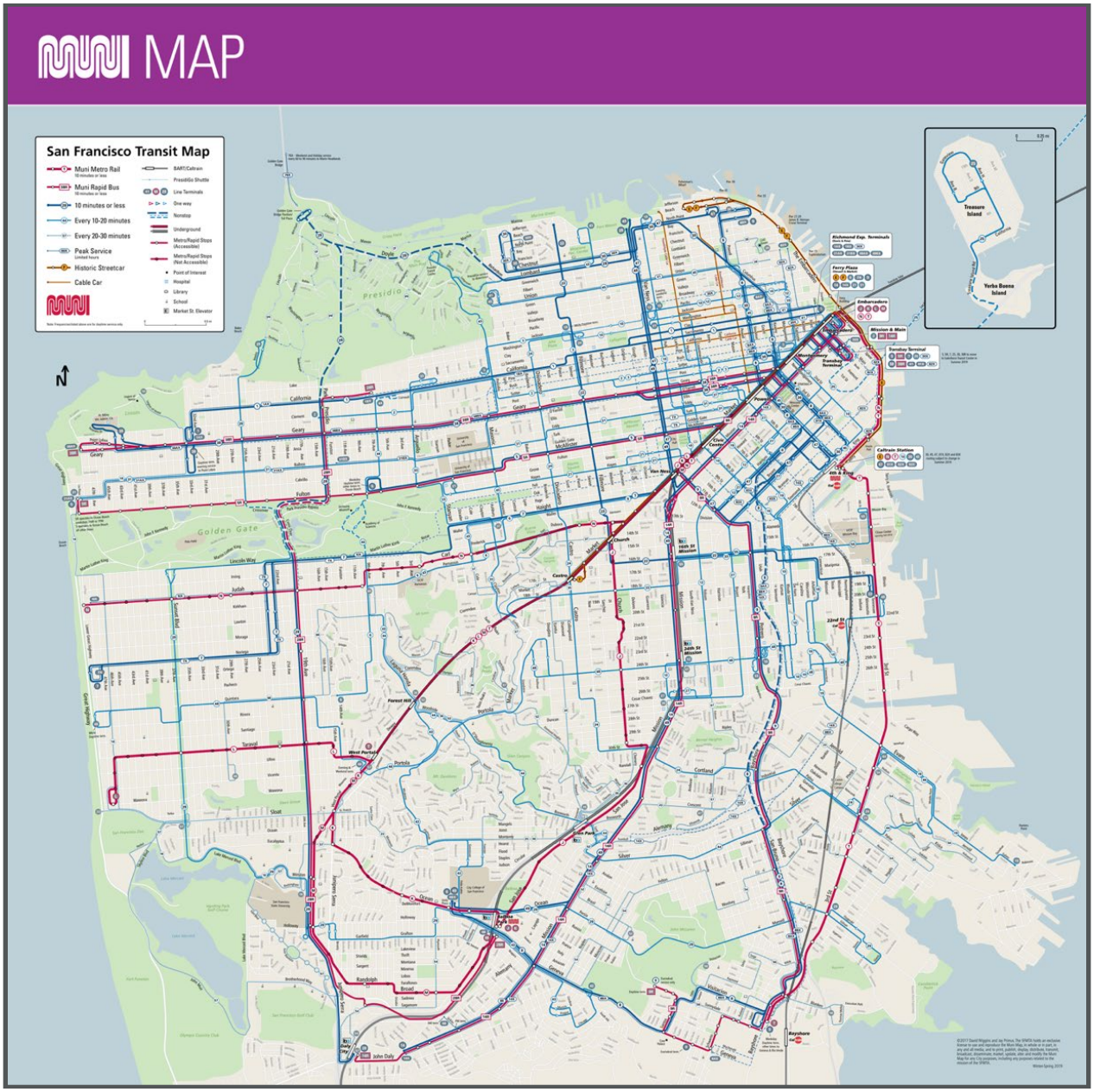
This situation, with the lack of designated service territory boundaries between the two utilities, is unlike any other in the country, and greatly limits the SFPUC's visibility into the detailed grid infrastructure and capacities. Despite multiple requests to gather details, PG&E will not provide information on feeder capacities unless the SFPUC submits an application for service through the Wholesale Distribution Tariff (WDT), a process that may require upwards of $150,000 and two years+ per service location to perform a System Impact Study to determine the capacity available for new loads.

Under the WDT, each SFPUC customer inter-tie point is viewed by PG&E as a utility-to-utility connection. As such, PG&E applies the rules of the WDT to each SFPUC customer connection. This is significant to the SFMTA in several ways, but particularly in terms of project timelines and budget. Each service upgrade that utilizes the PG&E grid must go through PG&E's review process. The SFPUC therefore has no control over processing delays or resource constraints. Upon completion of the review, any grid or infrastructure upgrades required by PG&E are born solely by the SFPUC customer. Being an SFPUC customer, the SFMTA would not be eligible for any betterment cost sharing, like PG&E retail customers

[4] SFMTA Short-Range Transit Plan Fiscal Year 2019 – Fiscal Year 2030, p. 9.
[5] SFMTA Bus Fleet Management Plan 2017-2030, p. 25.
[6] SFMTA San Francisco Mobility Trends Report 2018, Jan 28, 2019, p2.

would, regardless of the quantity of PG&E customers that would benefit from the investment. Similarly, the SFMTA is ineligible for PG&E's EV Fleet programs, which provide funding for grid infrastructure builds and upgrades that support EV charging.

Figure 2-2. SFMTA System Map



Source: SFMTA, Winter/Spring 2019, prior to COVID- 19 induced service suspension

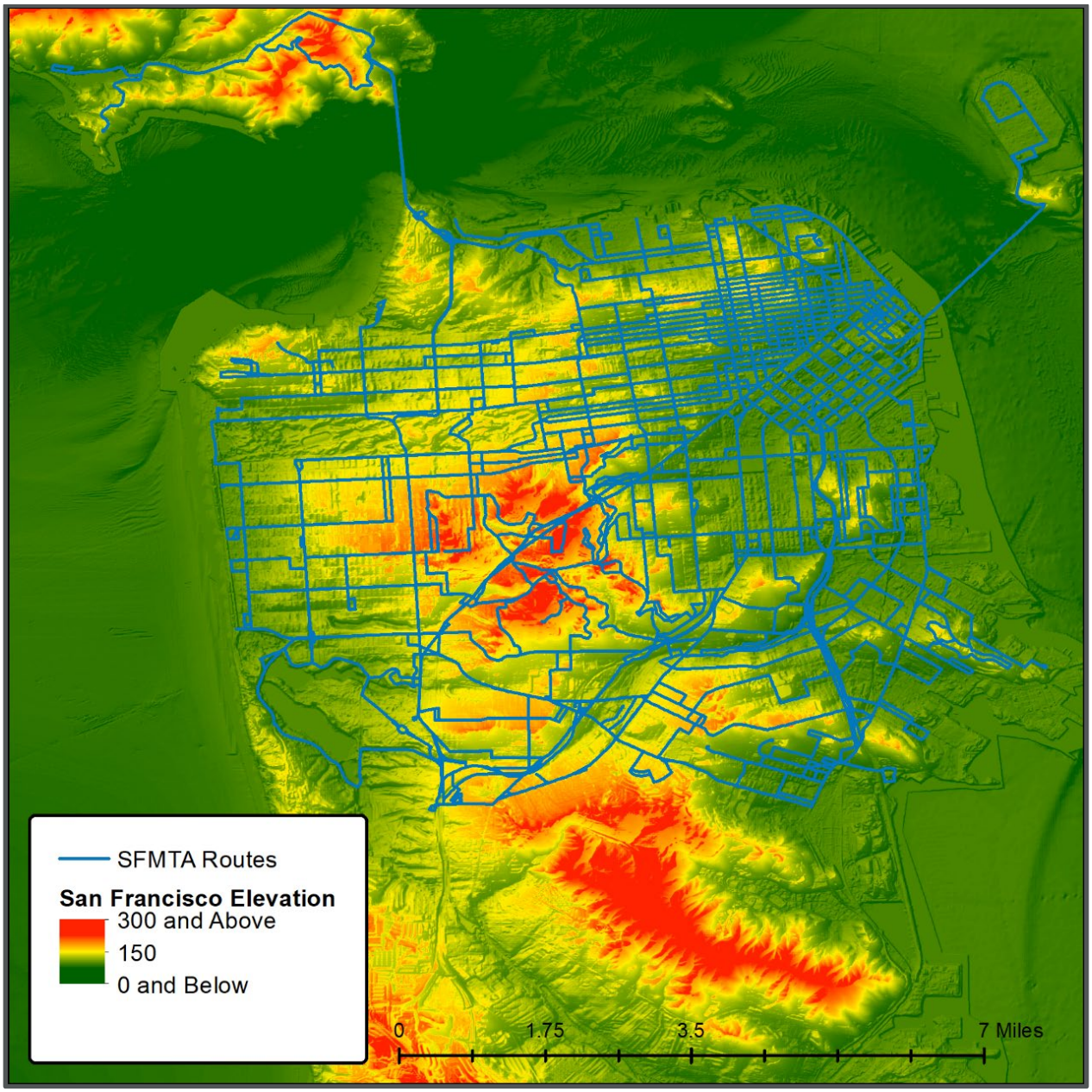
Environmental Factors

San Francisco's Mediterranean climate is characterized by dry summers and wet winters with relatively mild temperatures. Temperature does not vary much throughout the year, with average high temperatures of approximately 70°F during the summer, and average low temperatures of 45°F during the coldest winter days.

Topography is varied, with scores of hills ranging from seal level to over 900 feet in elevation. This varied topography, combined with the effects of cold ocean currents, gives rise to microclimates.

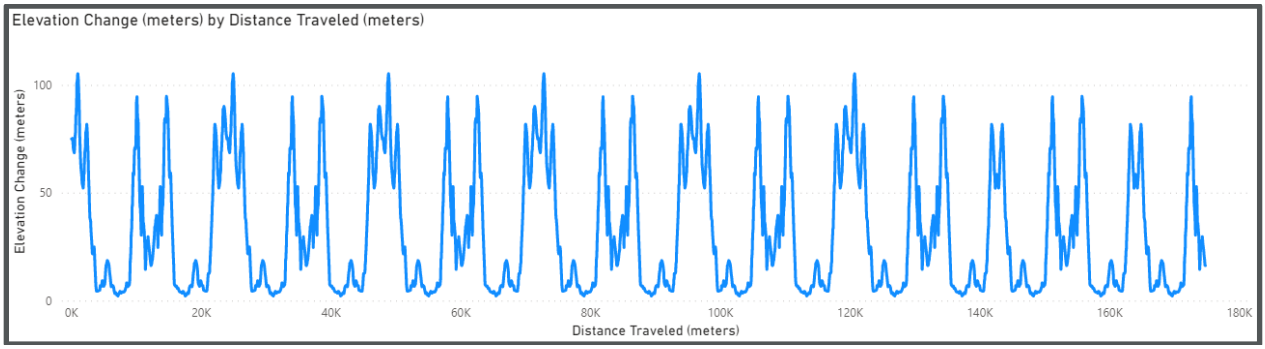
The SFMTA's buses must travel over multiple hills in a day – the steepest grade is 23%. Figure 2-3 shows San Francisco's service and the elevation profile, with much of the service feeding into downtown (which is near sea-level) over numerous hills. An example of the elevation change a transit vehicle may do while in-service is shown in Figure 2-4 with weekday vehicle block 1005 continuously traveling up and down hills for the entirety of its service. The block gains a total of 3,542 meters or 2.2 miles in a day (the equivalent of over 38 football fields or 11.6 times the height of San Francisco's tallest building, the Salesforce Tower, at 1,070 feet).

Figure 2-3. San Francisco Service and Elevation Profile



Source: WSP, USGS DEM

Figure 2-4. Vehicle Block 1005 Elevation Change



Source: WSP, USGS DEM

Schedule and Operations

As of January 2020, the SFMTA directly operates 844 diesel-hybrid and trolley buses on 76 regular weekday routes, which include supplemental Muni Metro Rail Owl service and routes with Rapid and Express service (e.g. Route 14, Route 14R, and Route 14X are three different routes) but excludes weekend-only route 76X and intermittent service to the Chase Center (78X and 79X).[7] These buses are served by six maintenance and storage yards: Flynn, Islais Creek, Kirkland, Potrero, Presidio, and Woods. Bus support functions also occur at 1399 Marin, and the SFMTA is planning bus storage improvements on 4 undeveloped acres east of the Muni Metro East light rail division. The SFMTA's trolley buses operate exclusively out of Potrero and Presidio yards, both of which are over 100 years old.

The SFMTA's fixed-route bus service is organized into six categories or types of service:

1. **Rapid Bus:** Routes that operate every 10 minutes, or more frequently, all day on weekdays and are the focus of transit-priority measures.
2. **Frequent:** Routes that also operate every 10 minutes, or more frequently, all day on weekdays in major corridors, but make more frequent stops than Rapid Bus routes.
3. **Grid:** Routes that form the framework of "trunk" routes across the city (along with Rapid and Frequent bus routes, and Muni SFMTA), with 12-30 minute headways all day on weekdays.
4. **Connector:** Shorter routes that provide coverage (including neighborhood "circulator" service to hillside neighborhoods) that generally operate every 30 minutes all day on weekdays.
5. **Specialized:** Routes with a focused purpose, including: express routes (primarily peak period-only services for commuters); supplemental service (to middle and high schools); and special event service (i.e., sporting events, concerts, etc.). Frequencies on these routes vary.
6. **Owl:** Some routes operate 24 hours a day, while other overnight routes (operating between 1 and 5 a.m.) are comprised of segments of multiple routes.

COVID-19-Related Impacts

As a response to the economic and health impacts of COVID-19, the SFMTA has made major interim service changes, including the closure of Muni Metro and prioritization of core bus routes (per the Muni Core Service Plan).

[7] This is based on January 2020 (pre-COVID) service.

The Muni Core Service Plan (April 2020) prioritizes the most-used routes to provide access to San Francisco's medical facilities while also increasing the volume of buses (to promote social distancing) for riders that are most reliant on transit. As of September 2020, the COVID-19 situation has resulted in a 71% reduction in bus boardings and a 95% reduction in transit revenue compared to the same time in 2019.

The federal government, through the CARES Act, provided some relief to the SFMTA to address the funding shortfall. However, long-term service levels will be contingent on revenues, ridership, and finding creative solutions to deliver that service efficiently and effectively.

COVID-19 directly impacts the SFMTA's transition to a zero-emission fleet due to increased uncertainty of various important factors: future ridership, changes and adaptations to service planning, continued emergency declarations and operations, general economic health or recession, and capital funding.

2.1.5 The SFMTA's Existing ZEB Efforts

The SFMTA is a national leader in confronting climate change and embracing the prospects of a ZE future. The SFMTA has taken multiple steps to not only meet the requirements of CARB's ICT regulation, but also its own ambitious ZE goals, as detailed below.

— The SFMTA currently operates the largest fleet of ZE trolley buses in North America. Trolley buses run on 100% greenhouse gas-free hydropower via an overhead catenary system (OCS). The SFMTA also operates over 600 diesel-hybrid vehicles that run on batteries and renewable diesel.

— In April 2018, in celebration of Earth Day, the then current mayor, Mark Farrell, committed the City of San Francisco to net-zero greenhouse gas emissions by 2050, which would eliminate the city's carbon footprint. The SFMTA is already doing its part and accounts for less than 2% of citywide transportation emissions (45%).

— In partnership with the San Francisco Department of the Environment, the SFPUC, and other city agencies and stakeholders, the SFMTA supported the development of the Electric Mobility Roadmap that lays out a vision for reducing public health and environmental impacts of private transportation. The Roadmap also identifies strategies to help realize an emission-free transportation sector.

— In May 2018, the Board adopted its Zero-Emission Vehicle Policy resolution (ZEV Policy). Under the ZEV Policy, demonstrating the SFMTA's commitment to achieving a 100% zero-emission fleet by 2035.[8]

— In November 2019, the SFMTA procured nine 40-foot BEBs (three each from New Flyer, Proterra, and BYD). These buses will be piloted in regular revenue service to analyze performance and to assist in developing a long-term charging strategy (expected delivery in early 2021).[9] This pilot program includes an electrical and facility upgrade at Woods Yard to accommodate BEB charging equipment and infrastructure.

— In 2018, as part of its Green Zone program, the SFMTA replaced 68 buses with diesel-hybrid buses outfitted with higher capacity batteries and a GPS-enabled switch, which automatically switches the bus to EV mode as it enters geo-fenced areas (Green Zones) throughout the city. In Green Zones,

[8] Due to the impacts of COVID-19 (reduction in ridership, funding, etc.), the SFMTA is revisiting this policy to align it with the ICT regulation (2040).
[9] Nine buses are currently procured with an additional three in negotiations.

the vehicles operate entirely on battery power, reducing and eliminating SFMTA-generated emissions in some of the city's most environmentally burdened communities.

— In February 2020, the SFMTA awarded a contract to WSP to provide a roadmap for the SFMTA's transition to BEB facilities and transit fleet vehicles. This partnership will produce several deliverables that will guide the SFMTA to meet their electrification goals, including a BEB Facility Implementation Master Plan (Master Plan).

— In 2021, the SFMTA procured three 40-foot BEBs from Nova. These buses will be piloted in regular revenue service along with the existing BEBs to analyze performance and to assist in developing a long-term charging strategy (expected delivery in late 2022).

2.2 Rollout Plan Approach

In accordance with the Rollout Plan Guidance, this document provides an overview of several key components to the SFMTA's ZEB transition, including fleet acquisitions, schedule, training, and funding considerations.

Due to the rapidly evolving nature of ZEB technologies, it is likely that the recommended approaches in this Rollout Plan will be adjusted and changed over time. For that reason, the SFMTA will continue to evaluate technologies and strategies throughout the transition process. Areas that are currently under study will be indicated, where applicable. The service-related information in this Rollout Plan is based on January 2020 service (pre-COVID) and the fleet numbers are based on September 2020.

It should also be noted that COVID-19 has caused unprecedented losses in the SFMTA's revenue through the loss of ridership (fares) and the reduction in sales tax revenue. For these reasons, the SFMTA has reduced service and operations and continues to adapt in the near term and forecast the long-term implications on the system and the agency's capital projects and goals. While the impact of COVID-19 on the SFMTA's electrification pursuant to the ICT regulation is still unclear, the SFMTA will continue planning and adjust as needed once COVID-19 is stabilized and trends are more predictable.

2.3 Rollout Plan Structure

In accordance with CARB's Rollout Plan Guidance, the SFMTA's Rollout Plan includes all required elements. The required elements and corresponding sections are detailed below:

— Transit Agency Information (Section 1: Rollout Plan Summary)

— Rollout Plan General Information (Section 1: Rollout Plan Summary)

— Technology Portfolio (Section 2.1.3: ZEB Suitability for the SFMTA's Service and Operations)

— Current Bus Fleet Composition and Future Bus Purchases (Section 3: Fleet and Acquisitions)

— Facilities and Infrastructure Modifications (Section 4: Facilities and Infrastructure Modifications)

— Providing Service in Disadvantaged Communities (Section 5: Equity Considerations)

— Workforce Training (Section 6: Workforce Training)

— Potential Funding Sources (Section 7: Costs and Funding Opportunities)

— Start-up and Scale-up Challenges (Section 8: Start-up and Scale-up Challenges)

3 Fleet and Acquisitions

The following section provides an overview of the SFMTA's existing fleet, planned ZEB technology, and proposed procurement schedule.

3.1 Existing Bus Fleet

The SFMTA bus fleet includes diesel-hybrid (DHEB) and electric trolley buses ranging from 30- to 60-feet. As of September 2020, the SFMTA operates a fleet of 844 buses.

The fleet is served by six bus maintenance and storage yards, two for trolley buses, two for 60-foot buses, and two for standard (30- and 40-foot) buses. Table 3-1 provides a detailed overview of the SFMTA's existing bus fleet.

Table 3-1. Summary of the SFMTA's Existing Bus Fleet

Manufacturer	Series	Fuel Type	Length	In Service Year	Bus Type	Quantity
	8601-8662; 8701-8710; 8713-8750	DHEB	40'	2013	Standard	111
	8711			2014		1
	8800-8859; 8861; 8864-8866; 8869; 8871			2016		66
	8751-8780; 8860; 8862-8863; 8867-8868; 8870; 8872-8901			2017		66
	8902-8955			2018		54
	8956-8969			2019		14
	6500-6544; 6546-6553; 6700		60'	2015	Articulated	54
	6545; 6554; 6560-6605l; 6701-6730			2016		78
	6606-6644; 6646-6647; 6649-6650; 6653			2017		44
	6645; 6648; 6651-6652; 6654-6697			2018		48
	5701-5798	Trolley Bus	40'	2018	Standard	98
	5799-5885			2019		87
	7201-7225		60'	2015	Articulated	24
	7224; 7226-7260			2016		36
	7261-7280			2017		20
	7281-7293			2018		13
	8501-8530	DHEB	30'	2007	Standard	30
					Total Buses	**844**

Source: SFMTA, September 2020

3.1.1 Battery-Electric Bus Technologies

The SFMTA intends to transition its DHEBs to BEBs. The SFMTA's future BEBs are expected to be compatible with the Society of Automotive Engineers' (SAE) J1772 (plug-in) and SAE J3105 (pantograph) charging standards. By supporting both standards, the SFMTA's buses will have the flexibility of charging in multiple layouts and orientations. The plug-in standard will allow buses to charge while being serviced, and the pantograph standard will allow buses to charge at the base and at potential on-route charging locations. The roof-mounted charging rails that are associated with the pantograph standard will allow the SFMTA's BEBs to access "fast" high-power charging (in excess of 150 kW) for a limited duration.

Based on the SFMTA's existing service needs and yard configurations, it is recommended that an inverted pantograph-charging strategy be implemented to support BEBs at all six yards. The pantographs will be supported by an overhead frame that covers the surface of the bus parking tracks. The overhead strategy was deemed to be the most suitable due to space constraints at the SFMTA's yards. The overhead frame will also be able to support photovoltaic panels (where applicable) and electrical equipment and components (conduit, etc.). Exceptions to the overhead frame solution could potentially occur in multi-level facilities as they are rebuilt, such as Potrero and Presidio Yards. Future design of those facilities would likely either include an overhead frame or an equipment mezzanine, but the SFMTA will leave those decisions to the facility design teams.

The proposed facility layouts for each yard are based on utilizing a 150-kW DC charging cabinet in a 1:2 charging orientation (one DC charging cabinet energizes two separate dispensers/buses). This charger-to-dispenser ratio maximizes space utility, reduces capital costs, and meets the requirements to charge the fleet during servicing and dwell time on the site while minimizing the peak electrical demand. That said, the SFMTA continues to monitor technological advancements and may explore other strategies that are advantageous to the SFMTA.

Figure 3-1 shows an example of a pantograph and charge rails.

Figure 3-1. Inverted Pantograph and Charge Rails

Source: WSP

3.2 Procurement Schedule

In accordance with the ICT regulation, the SFMTA will prioritize ZEB purchases and progressively increase the percentage of ZEB purchases over time. As planned, starting in 2027, all the SFMTA's new bus purchases will be zero-emission vehicles (BEB and Trolleys) - two years before the ICT regulation requires.

Early retirement should not be an issue pursuant to the ICT regulation (2040) based on the SFMTA's future purchases. However, if early retirement becomes a risk, one potential strategy is to place newly acquired buses on the SFMTA's longest (distance) service blocks. This will ensure that buses meet the Federal Transit Administration's (FTA) 500,000-mile minimal useful life requirement sooner. Prior to implementing such a measure, the SFMTA will conduct an equity analysis to ensure that service distribution and vehicle choice is equitable across neighborhoods and districts.

Table 3-2 summarizes the SFMTA's anticipated procurements through 2040 and Figure 3-2 presents the percentage of the fleet that are powered by zero-emission technologies or fossil fuels through the same timeframe. Table 3-3 summarizes the SFMTA's planned fleet totals through 2040. These are built on the assumption that BEBs and associated battery capacities will be available to meet the SFMTA's service block ranges so that a 1:1 replacement ratio with DHEBs is achievable. It should be noted that this is

contingent on the availability of funding, whether battery technology can meet the SFMTA's range requirements, and whether facilities and utility enhancements are completed. The COVID-19 pandemic has caused uncertainty in the long-term impacts to the SFMTA's funding and service. Staff is actively analyzing these changes and will update the schedule accordingly.

In 2023/4, the SFMTA plans to apply at least 20 "Bonus Credits" and up to 12 BEBs early purchases (SFMTA would have 12 BEBs operating in revenue service during this time) to their procurement to satisfy the 25% ZEB purchase requirement. In the year 2027 and beyond, all new bus purchases will be 100% zero-emission vehicles – two years prior to the ICT regulation's requirements.

Table 3-2. Summary of the SFMTA's Future Bus Deliveries (Through 2040)*

Existing Fleet	32ft MC		40ft MC			40ft TB		60ft MC		60ft TB	Total Procured
Procurement Type	Hybrid Rep.	BEB Rep.	Hybrid Rep.	BEB Rep.	BEB Exp.	Trolley Rep.	BEB Rep.	BEB Rep.	BEB Exp.	Trolley Rep.	
2021					3						3
2022	30				9						39
2023											0
2024				12							12
2025			69						6		75
2026			31								31
2027								48			48
2028				11				79	4		94
2029				45	34			5	26		110
2030				48				42	20		110
2031				28				50		12	90
2032				40					2	48	90
2033				31		21			5	33	90
2034					20	80			10		110
2035		9			20	81					110
2036		21		21	5	3					50
2037				69							69
2038				31				6			37
2039								48			48
2040				11				79			90
Notes	"MC": Motor Coach (Hybrid or Battery Electric Bus), "TB": Trolley Bus, "Exp.": Expansion, "Rep.": Replacement, "BEB": Battery Electric Bus										

Note: The SFMTA's existing DHEBs are expected to be replaced with BEBs 12 years after their in-service date. This procurement schedule assumes a 1:1 replacement ratio with BEBs being replaced every 12 years (mirroring 12-year warranties) and does not incorporate fleet growth projections/additions as these are still currently under study.

*SFMTA expects that the NTP for the buses delivered in the table above would be issued at least 12-18 months in advance.

Figure 3-2. Percentage of Zero-Emission and Fossil Fuel Fleet (2021-2040)

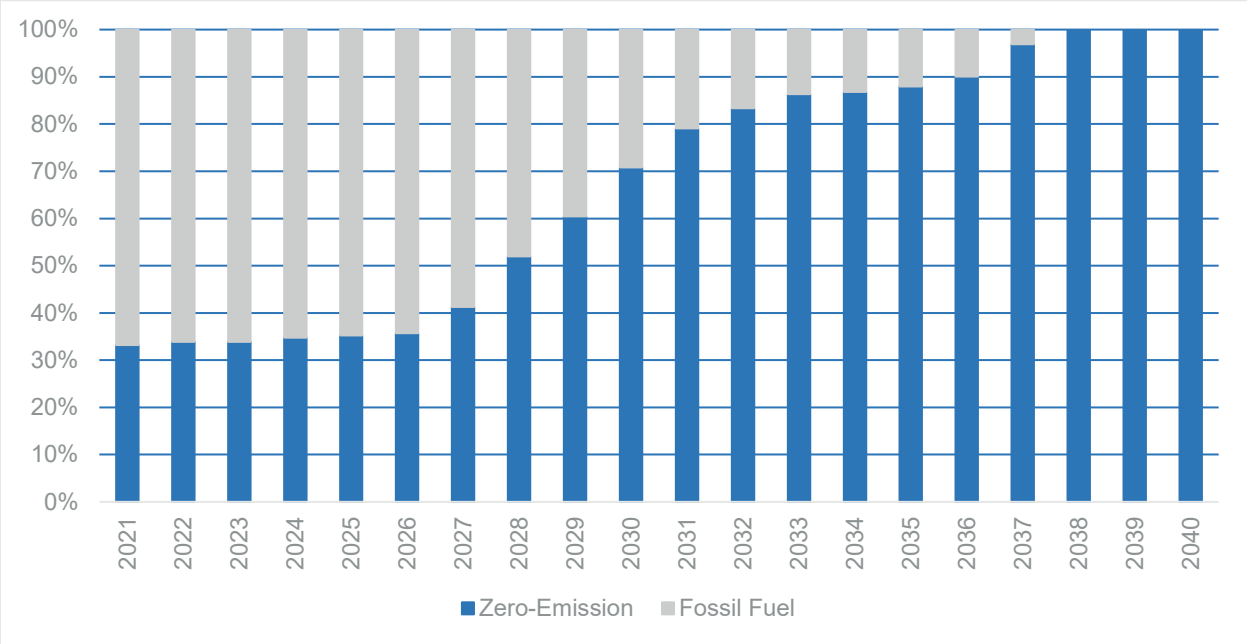


Table 3-3. Total Fleet Size Each Year

	32 DHEB	32 BEB	40 DHEB	40 BEB	40 TB	60 DHEB	60 TB	60 BEB	Total
2021	30	0	312	3	185	224	93	0	847
2022	30	0	312	12	185	224	93	0	856
2023	30	0	312	12	185	224	93	0	856
2024	30	0	312	24	185	224	93	0	868
2025	30	0	312	24	185	224	93	6	874
2026	30	0	300	24	185	224	93	6	862
2027	30	0	300	24	185	176	93	54	862
2028	30	0	289	35	185	97	93	137	866
2029	30	0	244	114	185	92	93	168	926
2030	30	0	196	162	185	50	93	230	946
2031	30	0	168	190	185	0	93	280	946
2032	30	0	128	230	185	0	93	282	948
2033	30	0	100	258	185	0	93	287	953
2034	30	0	100	278	185	0	93	297	983
2035	21	9	100	298	185	0	93	297	1003
2036	0	30	100	303	185	0	93	297	1008
2037	0	30	31	372	185	0	93	297	1008
2038	0	30	0	403	185	0	93	297	1008
2039	0	30	0	403	185	0	93	297	1008
2040	0	30	0	403	185	0	93	297	1008
Notes	"DHEB": Diesel Hyrbid Electric Buses, "BEB": Battery Electric Bus, "TB": Trolley Bus,								

Source: WSP

3.2.1 ZEB Bonus Credits

Based on the ICT regulation, the SFMTA is entitled to 18 bonus credits for their existing trolley buses[10] and will have 12 early purchases available for their planned BEB pilot buses[11], resulting in 30 available credits for the SFMTA. As indicated above, the SFMTA plans to exercise these credits in the 2023/4 procurement. In lieu of the 25% ICT ZEB purchase requirement, the SFMTA will use 28 of their credits (25% of 112 buses).

3.2.2 ZEB Range Requirements and Costs

Approximately 9% of the SFMTA's existing bus blocks travel farther than 150 miles per weekday – a range that exceeds current batteries' capabilities.[12] To reduce impacts to service, there are several strategies that the SFMTA can consider to meet service (range) requirements, including midday charging, battery/charging management systems, on-route chargers, additional bus purchases, and solar and battery storage. In addition, with battery technology rapidly evolving, future battery capacities and efficiencies may be sufficient to serve all blocks..

3.2.3 ZEB Conversions

Conventional bus conversions to ZEB technologies are not currently being considered. However, the SFMTA will remain open to conversions if they are deemed financially feasible and align with ZEB adoption goals.

[10] Per the ICT regulation: "Each electric trolley bus placed in service between January 1, 2018, and December 31, 2019, receives one-tenth of a Bonus Credit that will expire by December 31, 2024."
[11] Nine buses are currently procured with an additional three in negotiations.
[12] This is based on January 2020 (pre-COVID) service.

4 Facilities and Infrastructure Modifications

The following sections provide an overview of the existing fleet (by yard), proposed charging strategies, infrastructure, yard improvements, and program schedule.

4.1 Overview of Existing Facilities

The SFMTA has six yards, all of which will require significant capital improvements to accommodate a 100% zero-emission fleet. Table 4-1 summarizes the number and type of buses that are currently stored at each facility and Figure 4-1 presents the locations of each yard.

Table 4-1. Summary of Existing Yards and Fleets

Yard	Address	Total	Diesel Hybrid Buses			Trolley Buses	
			30’	40’	60’	40’	60’
Flynn	1940 Harrison St.	119	-	-	119	-	-
Islais Creek	1301 Cesar Chavez St.	115	10	-	105	-	-
Kirkland	2301 Stockton St. and 151 Beach St.	91	-	91	-	-	-
Potrero	2500 Mariposa St.	146	-	-	-	53	93
Presidio	949 Presidio Ave.	132	-	-	-	132	-
Woods	1095 Indiana St.	241	20*	221	-	-	-
	Total	844	30	312	224	185	93

Source: SFMTA Master Fleet Assign Ratio, September 2020

Figure 4-1. The SFMTA's Bus Yards

Source: WSP

4.2 ZEB Facility and Infrastructure Strategy

Since ZEB technology continues to evolve, it is difficult to commit to a costly strategy that may quickly become outdated or obsolete. However, it is also important to ensure that strategies are future-ready. For this reason, the recommended facility and infrastructure modifications are based on what each yard is planned to accommodate in 2040 per the *2017 SFMTA Facilities Framework* report and resulting *Building Progress* capital program. Since service changes and bus movements may occur multiple times a year, by establishing a full-build scenario, the SFMTA can optimize and tailor strategies based on existing (or anticipated) service.

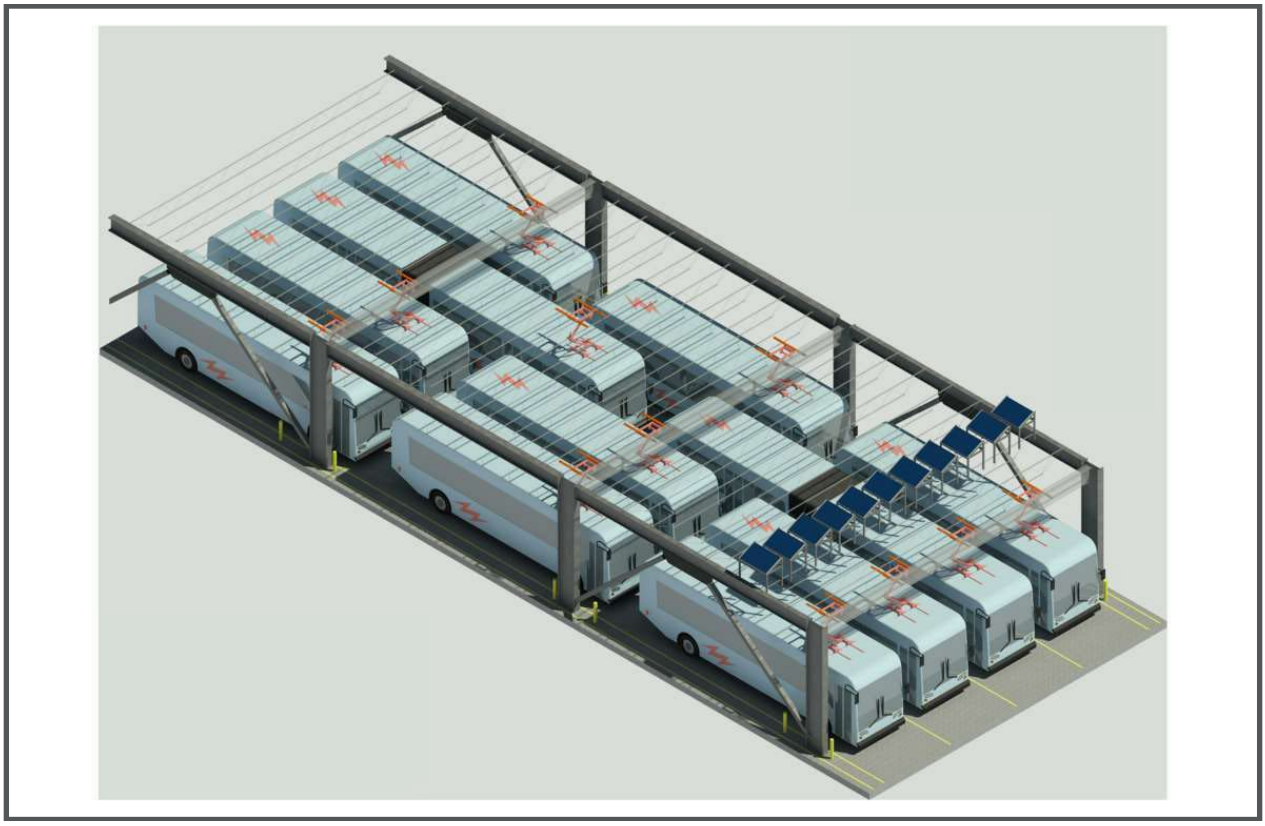
The SFMTA's transition to a zero-emissionfleet will require an increase in the electrical supply to the site, enhancements and expansions of electrical equipment, and the installation of gantries, chargers, dispensers, and other components. These modifications must occur at all six yards. While the SFMTA is not currently actively seeking on-route charging locations, we remain open to the concept, particularly if it is required to meet the service plan.

During preliminary concept discussions, both conductive and inductive charging solutions were considered and analyzed by the SFMTA and the design team. Based on several factors, including the space constraints at each yard and the desire for uniform infrastructure for ongoing maintenance efficiency, the SFMTA committed to an inverted pantograph strategy for all yards. However, where applicable, such as in maintenance areas, plug-in dispensers may be utilized.

To support the inverted pantographs, a scalable and modular overhead support structure is proposed in open bus yards to retain maximum bus parking capacity while implementing BEB charging. This type of overhead structure can be rapidly modified to meet changes in the SFMTA's fleet mix. The system consists of an overhead structure spanning up to four tracks of bus parking with pantographs mounted at various five-foot intervals as required by the assigned bus fleet. Charger cabinets, switchboards, transformers, and all electrical distribution will be kept above the bus parking area, where possible, to avoid costly trenching and reduce service interruptions during the transition.

Figure 4-2 illustrates inverted pantographs mounted to the modular overhead support structure.

Figure 4-2. Inverted Pantographs and Modular Support Structure



Source: WSP
Note: The frame can also support plug-in dispensers.

The proposed layouts are based on utilizing a 150-kW DC charging cabinet in a 1:2 or 1:3 charging orientation (one DC charging cabinet energizes two separate dispensers/buses). This charger-to-dispenser ratio would meet the requirements to charge the SFMTA's fleet overnight and minimize peak electrical demand.

4.3 ZEB Transition

The process of integrating BEBs into the SFMTA's fleet is very complex. Each yard will need to have sufficient power (utility enhancements) and charging infrastructure in place before buses are delivered. While the utility enhancements can generally be done without impacting normal operations, the installation of the support structure and charging equipment (chargers, switchgear, transformer, etc.) could negatively impact operations. For that reason, the planning of distinct on-site construction stages and program-level phasing is essential.

Staging

To avoid service disruptions and operational impacts, the SFMTA's yards will undergo BEB upgrades in several on-site stages. These "stages" are segments of the yard that will be temporarily shut down to install the necessary BEB-supporting infrastructure. The buses that would normally occupy the staging space will be temporarily relocated on-site (if space allows) or to a neighboring yard or facility. This approach will ensure that construction and normal operations can proceed concurrently. This construction method avoids the complete shutdown of the yard undergoing improvements, which reduces the risks of service impacts.

The number of stages and number of buses that need to be temporarily relocated during each stage vary based on a yard's layout, existing fleet, and additional capacity.

Phasing

In order to electrify the fleet by 2040, it will be necessary to have multiple yards undergoing construction, concurrently. "Phases" are essentially classifications of when and how these yards are grouped. Typically, the phase in which a yard is transitioned is based on agency's priorities or technical feasibility. The SFMTA is also concurrently implementing a facility capital rebuild program. When conceived in 2017, the *Building Progress Program* proposed rebuilds of the SFMTA's three oldest and most obsolete facilities: Potrero Yard, Presidio Yard, and Kirkland Yard. The *Building Progress Program* must be adapted to accommodate zero-emission vehicle infrastructure projects.

The number of phases, stages, and details on bus relocations are currently being analyzed and will be finalized in the SFMTA's ongoing Feasibility and Fleet Transition Plan Study.

Figure 4-3 presents a concept of Islais Creek Yard and how its construction can be staged.

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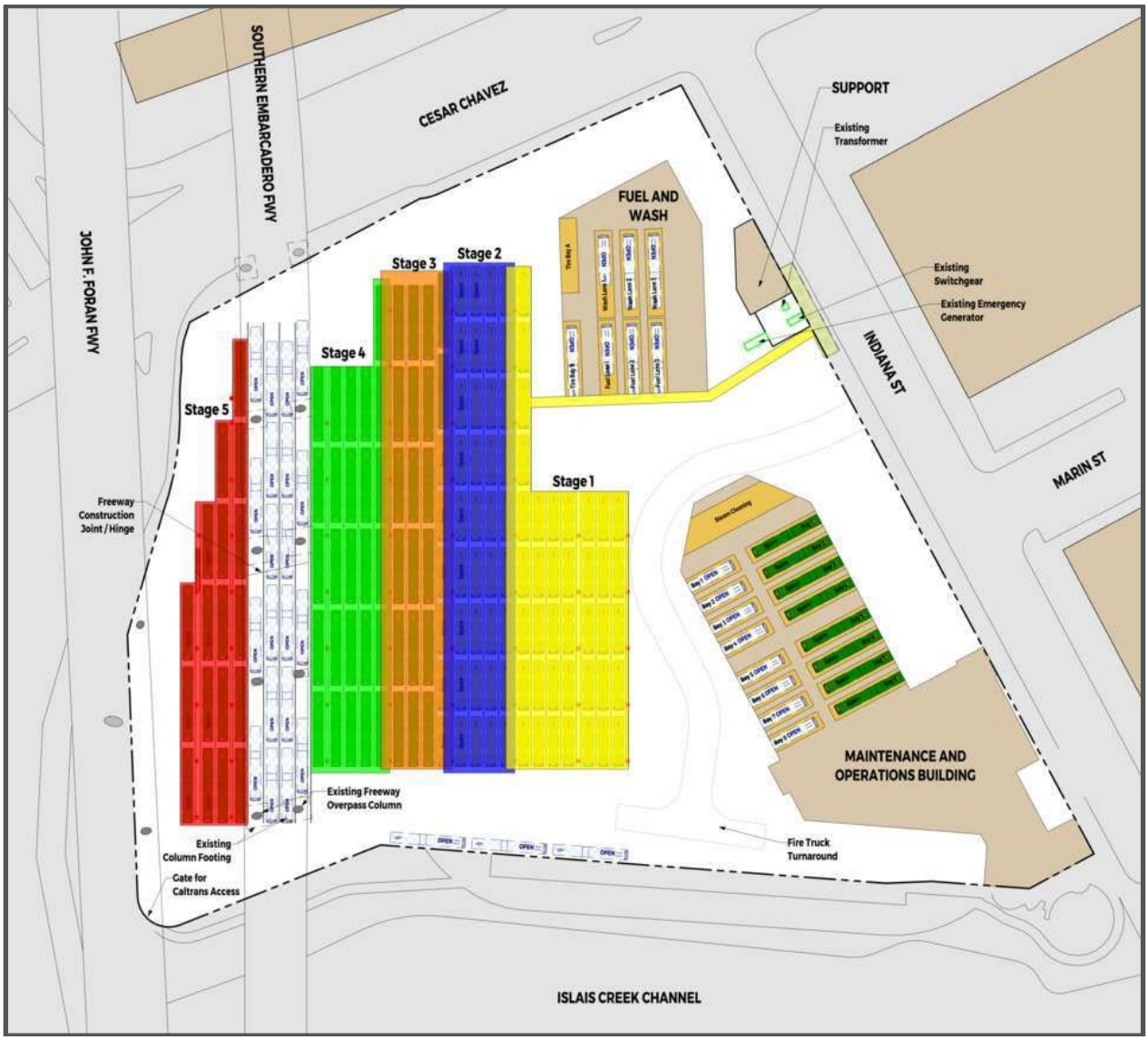
Figure 4-3. SFMTA Staging Example



Source: WSP

4.4 Transition Considerations

There are multiple factors and timetables that must be considered to meet the SFMTA's zero-emission fleet goals in accordance with the ICT regulation. Since BEBs are not operational unless the facilities are in place to energize them, it is essential to meet deadlines because it can impact both service and ICT regulation compliance.

The following provides a brief overview of the various processes and timetable assumptions for each, Figure 4-4 presents the proposed schedule for the SFMTA's zero-emission fleet conversion.

Bid Documents

The electrification process will require multiple subject matter experts, planners, designers, architects, engineers, OEMs, and contractors. For this reason, multiple requests for proposals (RFPs) will need to be developed and put out for bid for various phases of the project. For example, there may need to be an

RFP for a firm to take the project from 30% design to 100% design. There may also be a separate RFP for the construction component. This assumes a typical design-bid-build concept. For more complex rebuild projects, like Potrero and Presidio Yards, the projects will be delivered in a joint development progressive design-build or design-build model. The SFMTA will continue to evaluate the best strategy to meet goals. If a design-bid-build strategy were to be implemented, it is assumed that each stage of bidding would take six months.

BEB-Supporting Enhancements

With the amount of time it will take to construct the pantograph-supporting structures and other BEB enhancements, it is assumed that each "stage" of construction at a yard will take approximately six months to be completed. For example, a yard with three distinct stages would take approximately 18 months to be BEB-ready.

Utility Infrastructure Enhancements

Even with BEBs and BEB-supporting equipment in place, the fleet can only operate if the electrical utility and supporting circuits can meet the energy and power demands of the BEBs. In the SFMTA's case, power is provided by PG&E by way of SFPUC. The SFMTA must undergo a lengthy and uncertain process to request and receive additional power. This process includes an application, a study, permitting, planning and design, and construction (on behalf of SFPUC). This process could take as long as five years. The utility enhancements dictate when a yard is deemed fully operational for BEBs.

BEB Bus Procurements

It is assumed that buses can be procured 18 months before the conclusion of the BEB-supporting enhancements. Typically, ordering buses is not an arduous endeavor. However, the procurements will have to be aligned with the construction of charging equipment at the yard and utility enhancements.

Environmental Clearance

Yards that are scheduled to be demolished and rebuilt, such as Potrero and Presidio, are considered "projects" under the California Environmental Quality Act (CEQA) and an environmental impact report (EIR) will need to be prepared. The process of developing and certifying an EIR can take 2-3 years, pre-construction. The other four divisions may be exempt from developing an EIR pursuant to California's Senate Bill 288, if all requirements, including workforce and labor provisions, of the exemption can be met. The exemption, in part, grants extensions to "transit agency projects to construct or maintain infrastructure to charge or refuel zero-emission transit buses," However, the specific details and guidelines for the exemptions will be further evaluated in subsequent stages of planning.

Temporary Relocations

The SFMTA's 1399 Marin and Muni Metro East (MME) facilities have been identified as sites that can temporarily store and dispatch buses during construction at other sites. For instance, when Potrero and Presidio are being reconstructed, the SFMTA is planning to temporarily relocate their trolley bus fleets there. Procurement tables and construction schedules will have to be in alignment with the timing of these temporarily relocations to avoid scheduling delays or impacts to operations or service.

Yard Management and Operations

The layout and operations of the yard will be vastly different during and after construction. Currently, there are no range issues with the SFMTA's buses and the time it takes to fuel buses is negligible. However, with the transition from DHEBs to BEBs, more considerations to how buses are parked, operated, and

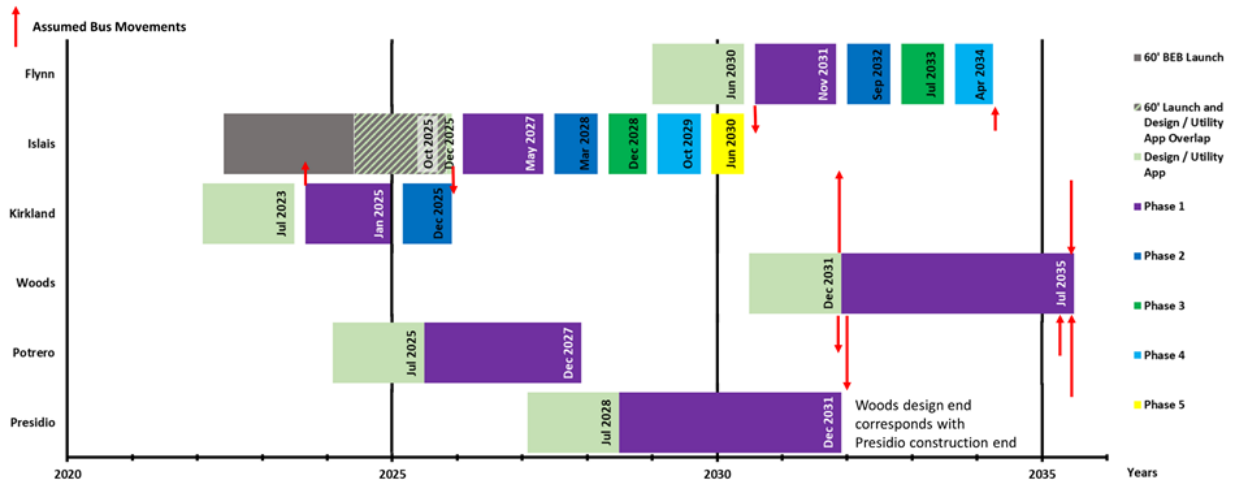
dispatched will be required due to the reduction in range and relatively long charge times. These issues will be even more important during the time(s) that yards are operating mixed fleets (BEB, TB, and DHEB). To mitigate any negative impacts to operations, significant planning and updates to standard operating procedures will be needed to achieve a successful transition.

Schedule

As indicated above, there are multiple prevailing factors that will dictate the SFMTA's transition schedule. Figure 4-4 illustrates a conceptual schedule that can meet ICT regulation goals. This schedule largely follows the priorities of the *2017 Facilities Framework* report and uses the utility provider's conservative five-year estimate as the span of time it will take to enhance all facilities. This schedule does not consider the specifics of bus procurement quantities, service planning, or phasing and is highly contingent on the SFMTA's funding and PG&E and SFPUC's ability to meet construction deadlines.

It should also be noted that the SFMTA is currently evaluating the cost effectiveness of implementing the BEB transition at two facilities that are generally in poor condition (Kirkland and Woods). The capital investment of BEB conversion is significant, and the SFMTA is committed to fiscally responsible capital projects that meet the larger needs of the SFMTA's service and workforce. All of these factors will have impacts to the conceptual schedule.

Figure 4-4. Conceptual Schedule



Source: WSP

4.5 Summary of Yard Enhancements

By 2040, all of the SFMTA's yards will be capable of operating a 100% zero-emission fleet. Table 4-2 summarizes the modifications and schedule of each yard, and the following sections detail the process of each yard's transition from existing conditions to zero-emission vehicle-readiness. The facility narrative is listed in alphabetical order.

Table 4-2. SFMTA ZEB Yard Summary

Yard	Address	Main Functions	Planned Infrastructure	Existing Capacity (2020)	Designated Charging Positions (2035)	Upgrades Req'd?	Timeline
Flynn	1940 Harrison St.	Storage/ O&M	Inverted Pantograph	119	107	Yes	2029-2034
Islais Creek	1301 Cesar Chavez St.	Storage/ O&M	Inverted Pantograph	132	117	Yes	2024-2030
Kirkland	2301 Stockton St. and 151 Beach St.	Storage/ O&M	Inverted Pantograph	95 (Day) 116 (Night)	91	Yes	2022-2025
Potrero	2500 Mariposa St.	Storage/ O&M	Inverted Pantograph	146	216	Yes	2024-2027
Presidio	949 Presidio Ave.	Storage/ O&M	Inverted Pantograph	132	227	Yes	2027-2031
Woods	1095 Indiana St.	Storage/ O&M	Inverted Pantograph	209	250	Yes	2030-2035

Source: WSP
Note: Potrero and Presidio will be fully rebuilt; the scope of the projects includes more than BEB enhancements. Woods will likely also be fully rebuilt.

4.5.1 Flynn Yard

Existing Conditions

Flynn Yard is located at 1940 Harrison Street in the City of San Francisco.

Currently, 119 60-foot diesel-hybrid buses are stored, maintained, fueled, and serviced at Flynn Yard. The yard includes a maintenance area with drive-through bays, transportation area, stand-alone wash canopy, and a stand-alone fuel canopy. All of these facilities are integrated into the lone, single-story building on the site. A tire shop is located separately from the main facility in a building across Harrison Street. The southeast corner of the main Flynn Yard has a cutout that houses separate businesses not related to or owned by the SFMTA. Electrical utility service is provided by the SFPUC.

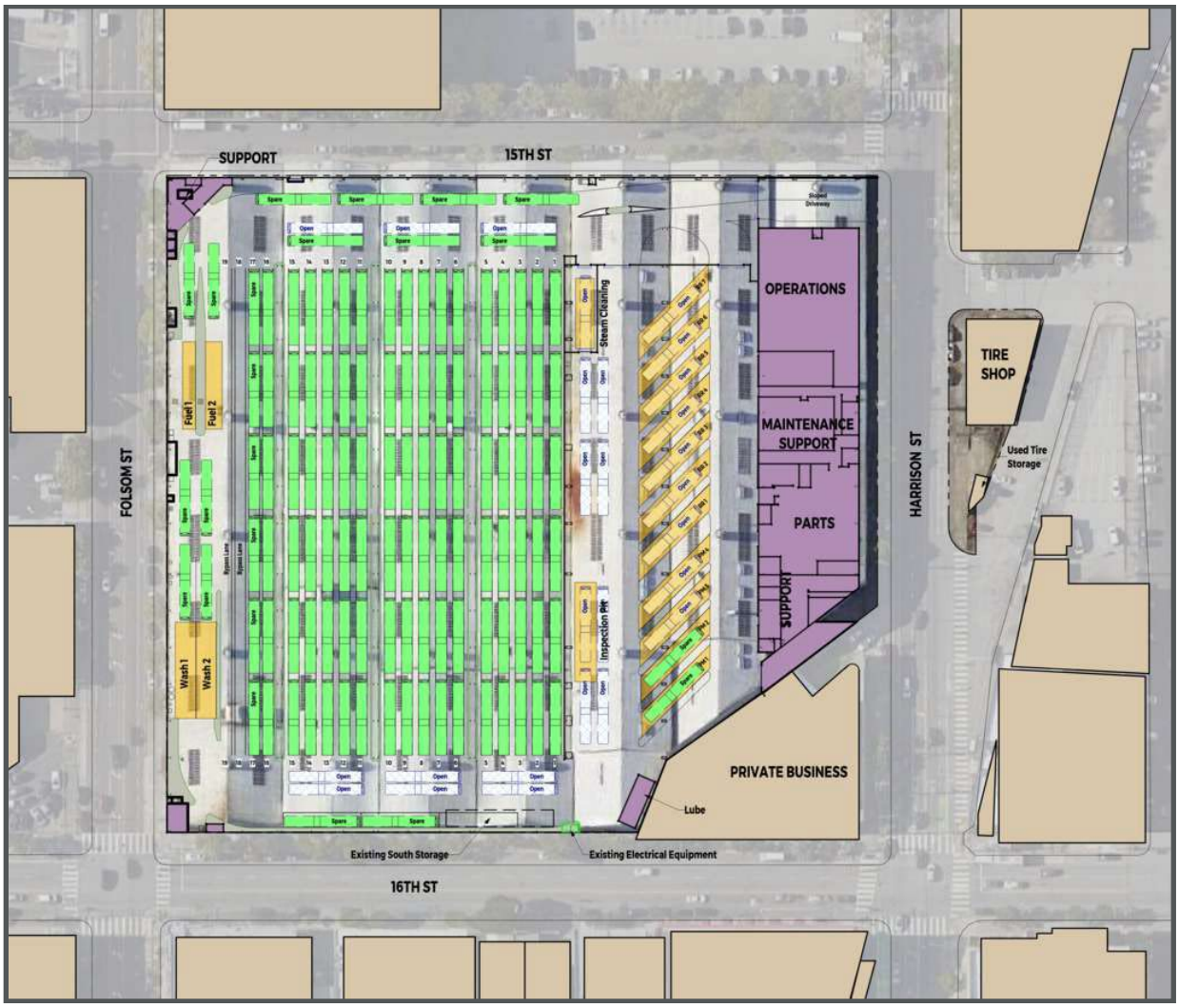
After revenue service, buses enter the yard from Harrison Street and are parked in unassigned, stacked (nose-to-tail) storage tracks in the northern circulation area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lanes. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. Non-revenue vehicles (NRVs) are parked in a row of spaces near the transportation area adjacent to the bus circulation's northernmost lane.

An aerial and site plan of Flynn Yard are presented in Figure 4-5 and Figure 4-6, respectively.

Figure 4-5. Flynn Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-6. Flynn Yard - Existing Conditions (Site Plan)



Source: WSP

Planned ZEB Modifications

The Flynn Yard will be capable of storing and charging 109 total BEBs. 107 buses can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional two buses can be charged in the maintenance bays via plug-in dispensers.

Table 4-3 summarizes the ZEB infrastructure planned at Flynn Yard.

Table 4-3. Flynn Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	119
No. of BEBs Supported (2040)	109
No. of Charging Cabinets	56
No. of Dispensers/Charging Positions	109

Source: WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio)

The following BEB equipment and locations are proposed:

— 56 DC charging cabinets located on a platform attached to the overhead support structure. 55 of these charging cabinets will distribute to 107 pantograph-charging positions over the existing storage tracks and satellite spaces. An additional charging cabinet will power two dispensers installed in the maintenance bays.

— The support structure columns are to be placed every two to three tracks. These columns will also provide the support for the overhead mounted pantographs.

The charging cabinets will be served by the following electrical infrastructure:

— Two interrupter switches and a meter to be installed on the southern exterior of the building along 16th Street. The first interrupter will be owned and operated by PG&E, and the second interrupter and meter will be owned by SFPUC. Power will be distributed from the meter up along and through the building exterior to the medium-voltage switchgear.

— One medium-voltage switchgear and three medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the proposed platforms.

Figure 4-7 illustrates the Flynn Yard at full build-out.

Figure 4-7. Flynn Yard - Full ZEB Build-Out

Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Flynn Yard would include the installation of two new interrupter switches on the exterior of the facility along 16th Street, routing the utility-provided power into the facility to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the easternmost four tracks of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule.

4.5.2 Islais Creek Yard

Existing Conditions

Islais Creek Yard is located at 1301 Cesar Chavez Street in the City of San Francisco.

Currently, 115 diesel-hybrid buses (10 30-foot and 105 60-foot) are stored, maintained, fueled, and serviced at Islais Creek Yard. The yard includes the following separate structures and major site areas: a two-story maintenance building, two-story transportation building, and a combined fuel, wash, and tire repair building. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Indiana Street and are parked in numbered, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lanes. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked throughout the site on facility exteriors and the yard perimeter.

Interstate 280 (I-280) traverses over the western side of the site with support columns located in the bus parking yard. Caltrans owns the property under I-280, which the SFMTA leases for bus parking. Due to Caltrans' I-280 maintenance requirements of the support columns and freeway, the SFMTA's ability to construct in this area of the yard may be significantly restricted. Any proposed BEB or other construction under I-280 need to be reviewed and approved by Caltrans.

An aerial and site plan of Islais Creek Yard are presented in Figure 4-8 and Figure 4-9, respectively.

Figure 4-8. Islais Creek Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-9. Islais Creek Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

The Islais Creek Yard will be capable of storing 153 total BEBs, of which, 149 can be charged (simultaneously). 145 buses can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional four buses can be charged in the maintenance bays via plug-in dispensers. As previously mentioned, Caltrans has an existing easement that may preclude or limit BEB infrastructure. The final determination of what can be built within this easement will be evaluated in future analyses.

Table 4-4 summarizes the ZEB infrastructure planned at Islais Creek Yard.

Table 4-4. Islais Creek Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	115
No. of BEBs Supported (2040)	153
No. of Charging Cabinets	75
No. of Dispensers/Charging Positions	149

Source : WSP
Notes: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).
Any proposed BEB or other construction under I-280 needs to be reviewed and approved by Caltrans.

The following BEB equipment and locations are proposed:

- 73 DC charging cabinets located on a platform attached to the overhead support structure spanning a portion of the bus storage tracks and terminating at the edge of the overhead I-280 offset limits.[13] These charging cabinets will distribute to 145 pantograph-charging positions over the existing main storage tracks with a gap in charging positions under I-280 for storing spare buses. The charging positions begin again in the parking area west of I-280's offset limits.

- The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

- Two charging cabinets and four dispensers located in the maintenance building (with four dispensers) will charge the eight remaining spare buses that cannot be charged in the main parking area.

The pantographs and charging cabinets will be served by the following electrical infrastructure:

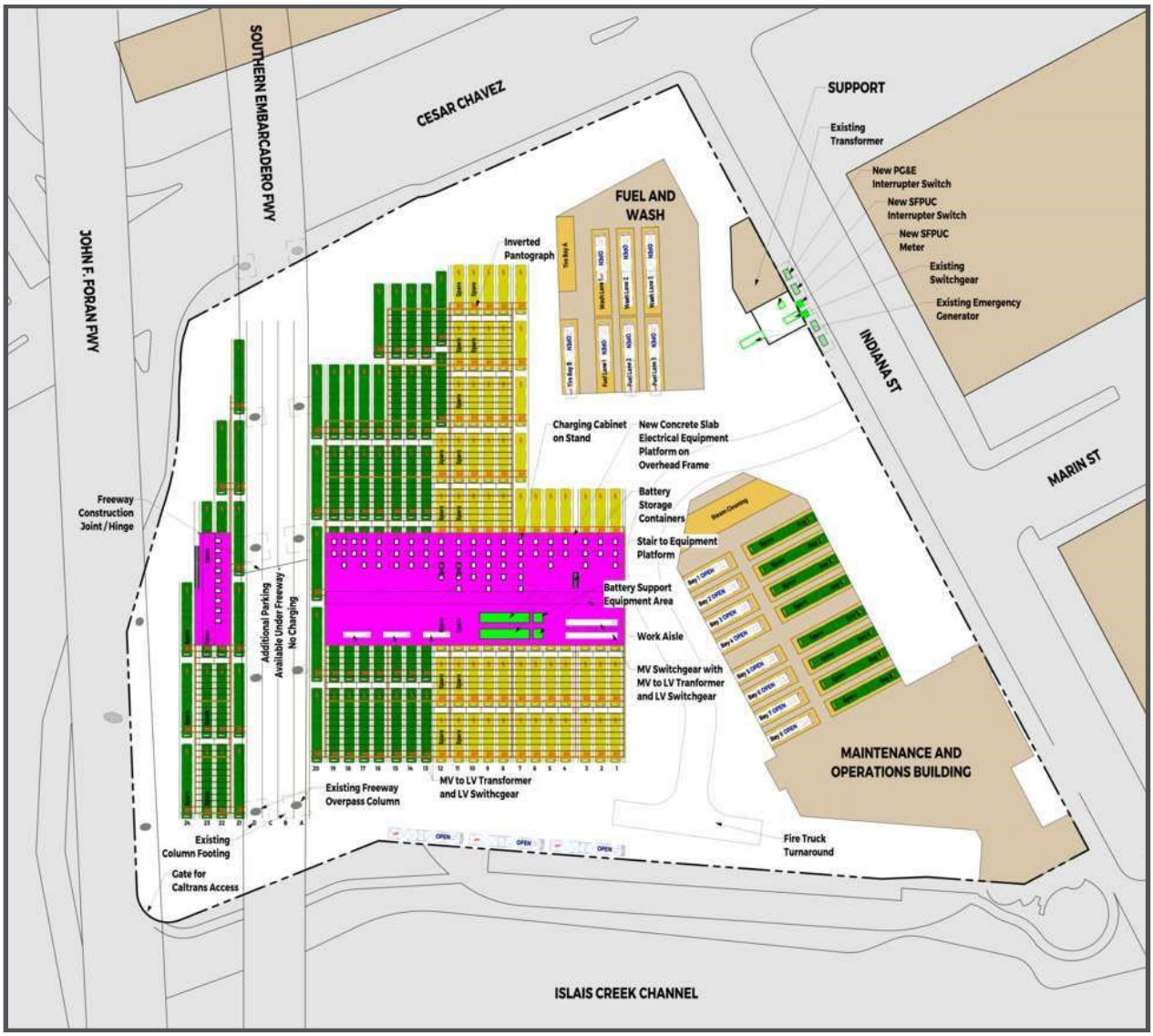
- Two interrupter switch pairs and two meters will be installed in the existing electrical yard. The first interrupter in each pair will be owned and operated by PG&E, and the second interrupter in each pair and both meters will be owned by SFPUC. Power will be distributed from the meter up along the fuel and wash building before crossing to the platform to the medium-voltage switchgear.

- Two medium-voltage switchgears and five medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the platform, above the bus parking area. The switchgear and transformers will be rated for exterior use.

Figure 4-10 illustrates the Islais Creek Yard at full build-out.

[13] Any proposed BEB or other construction under I-280 needs to be reviewed and approved by Caltrans.

Figure 4-10. Islais Creek Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Islais Creek Yard involves the installation of the four interrupter switches and two meters in the existing electrical yard and the routing of utility-provided power into the facility to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the easternmost seven tracks of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule

4.5.3 Kirkland Yard

Existing Conditions

Kirkland Yard is located at 2301 Stockton Street and 151 Beach Street in the City of San Francisco.

Currently, 91 standard diesel-hybrid buses are stored, maintained, fueled, and serviced at Kirkland Yard. The yard includes the following separate structures and major site areas: a maintenance canopy, one-story maintenance support building, one-story transportation building, wash lane (centered in the yard), stand-alone fuel building, and fuel storage yard with support equipment. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Stockton Street and are parked in unassigned, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lane, Track 9, if being washed (not all buses are washed due to site restrictions). After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked in a row of spaces along the northern site perimeter, where possible.

The *Building Progress Program* envisions a full rebuild of Kirkland Yard following completion of Presidio Yard (estimated 2029-2030). However, due to the operational necessity of Woods Yard and the high capital cost of converting to BEB at Woods, the SFMTA is now prioritizing the rebuild of Woods Yard in advance of Kirkland Yard. This means that Kirkland would be upgraded to BEB in its existing configuration as an interim improvement before a full buildout of the site closer to 2040.

An aerial and site plan of Kirkland Yard are presented in Figure 4-11 and Figure 4-12, respectively.

Figure 4-11. Kirkland Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-12. Kirkland Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

The Kirkland Yard will be capable of storing 81 total BEBs, of which, 77 can be charged (simultaneously). 72 can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional five buses can be charged in the maintenance bays via plug-in dispensers. To meet the 2040 conversion timelines, this would be an interim improvement for approximately 10-15 years. Then, the Kirkland Yard would need to be fully rebuilt around 2040.

Table 4-5 summarizes the ZEB infrastructure planned at Kirkland Yard.

Table 4-5. Kirkland Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	91
No. of BEBs Supported (2040)	81
No. of Charging Cabinets	39
No. of Dispensers/Charging Positions	77

Source : WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

The following BEB equipment and locations are proposed:

— 36 DC charging cabinets located on a platform attached to the overhead support structure spanning the northwest quadrant of the parking area. These charging cabinets will distribute to 72 pantograph-charging positions mounted from overhead support structures over the bus parking tracks.

— The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

— Three charging cabinets installed on a mezzanine located inside the new maintenance building adjacent to or near the electrical room. These charging cabinets will be connected to five dispensers installed between every two bays. This will provide charging for the nine buses that cannot be charged in the main parking area.

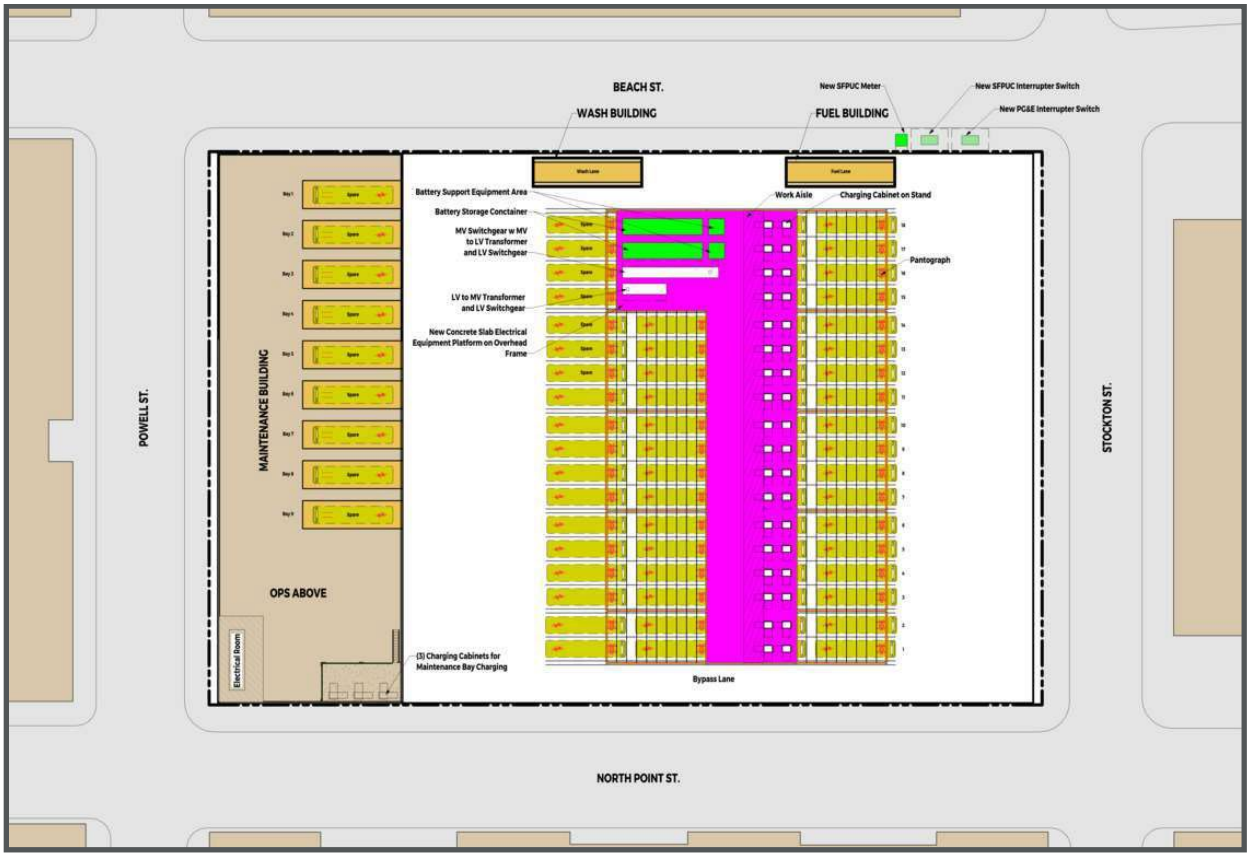
The pantographs and charging cabinets will be served by the following electrical infrastructure:

— One pair of interrupter switches and a meter will be installed on the northeast side of the site along Beach Street. The first interrupter will be owned and operated by PG&E, and the second interrupter and meter will be owned by SFPUC. Power will be routed up along the new fuel lane and across to the platform to feed the new medium-voltage switchgear.

— One medium-voltage switchgear and two medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the platform, above the bus parking area. The switchgear and transformers will be rated for exterior use.

Figure 4-13 illustrates a conceptual rebuild of Kirkland Yard with associated ZEB improvements.

Figure 4-13. Kirkland Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

Kirkland Yard was expected to be fully demolished and redeveloped prior to implementing BEBs on the site. However, due to financial and schedule issues, the SFMTA is developing an interim improvement at Kirkland that may include BEB infrastructure and several smaller facility improvement projects.

4.5.4 Potrero Yard

Existing Conditions

Potrero Yard is located at 2500 Mariposa Street in the City of San Francisco.

Currently, 146 trolley buses (53 40-foot and 93 60-foot) are stored, maintained, fueled, and serviced at Potrero Yard. The yard includes the following separate structures and major site areas: a two-story combined maintenance and transportation building, separate tire shop and body building, wash area, carbon-check area, and two separate bus parking yards. The upper yard and body/tire building are located on the deck above the maintenance building which is accessible from the north via 17th Street. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Mariposa Street and are parked in unassigned, stacked (nose-to-tail) storage tracks in front of the carbon check area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to have their carbon checked, fare retrieved, interior cleaned, and fueled before pulling forward to the bus wash area. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked along the western site perimeter.

Potrero Yard is over 100 years old and anticipated to be demolished and rebuilt with modern bus facilities and potential residential element per the Potrero Yard Modernization Project. The expected in-service date for the new building is end of 2026.

Figure 4-14 presents Potrero Yard under existing conditions.

Figure 4-14. Potrero Yard - Existing Conditions (Aerial)

Source: Google Earth

Planned ZEB Modifications

As previously mentioned, the Potrero Yard Modernization Project aims to rebuild and expand the 4.4-acre site. The goal of the project is to replace the obsolete two-story maintenance building and bus yard with a modern, three-story, efficient bus maintenance and storage garage, equipped to serve the SFMTA's grown fleet as it transitions to zero-emission fleet.

As of February 2021, the Project is about to enter the Request for Proposals phase, during which zero-emission vehicle modifications will be defined. As the future yard will to be multi-level, the Potrero Yard design guidelines include an overhead structure-mounted inverted pantograph-charging solution. Depending on the design choices made by the future Potrero Yard design team, the required electrical infrastructure could be installed in multiple configurations to suit the final design of the facility. Table 4-6 summarizes the zero-emission vehicle infrastructure proposed at Potrero Yard.

Table 4-6. Potrero Yard Zero-Emission Vehicle Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	146
No. of BEBs Supported (2027)	85

Source: WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio)

Phasing and Construction Strategy

Since Potrero Yard will be fully redeveloped prior to implementing BEBs on the site, it is recommended that the entire infrastructure and charging position deployment be included in the redevelopment project. This will allow the BEBs transition to occur concurrently to the planned redevelopment construction process and avoid any further operational interruptions.

4.5.5 Presidio Yard

Existing Conditions

Presidio Yard is located at 949 Presidio Avenue in the City of San Francisco.

Currently, 132 40-foot trolley buses are stored, maintained, fueled, and serviced at Presidio Yard. The yard includes the following separate structures and major site areas: a two-story combined maintenance and transportation building, wash area, carbon check area, and bus parking yard. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Presidio Avenue and are parked in unassigned, stacked (nose-to-tail) storage tracks in front of the carbon check area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to have their carbon checked, fare retrieved, interior cleaned, and fueled before pulling forward to the bus wash area. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked along the northern site perimeter.

Presidio Yard is over 100 years old and anticipated to be demolished and rebuilt with modern bus facilities. The Presidio Yard Modernization Project began pre-development and planning in early 2020. The expected in-service date for the new building is end of 2029.

Figure 4-15 presents Presidio Yard under existing conditions.

Figure 4-15. Presidio Yard - Existing Conditions (Aerial)

Source: Google Earth

Planned Zero-Emission Vehicle Modifications

Similar to Potrero Yard, Presidio Yard is planned to be fully redeveloped.

Although the design for the redevelopment project and specific zero-emission vehicle modifications are still being evaluated, it is recommended that the Presidio Yard adopt an overhead structure-mounted inverted pantograph-charging solution. Depending on the design choices and criteria developed by the SFMTA and the future Presidio Yard design team, the required electrical infrastructure could be installed in multiple configurations to suit the final design of the facility.

Table 4-7 summarizes the zero-emission vehicle infrastructure planned at Presidio Yard.

Table 4-7. Presidio Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	132
No. of BEBs Supported (2031)	85

Source : WSP
Note : It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

Phasing and Construction Strategy

Since Presidio Yard is expected to be redeveloped prior to implementing BEBs on the site, it is recommended that the entire infrastructure and charging position deployment be included in the redevelopment project. This will allow the BEB transition to occur concurrently to the planned redevelopment construction process and avoid any further operational interruptions.

4.5.6 Woods Yard

Existing Conditions

Woods Yard is located at 1095 Indiana Street in the City of San Francisco.

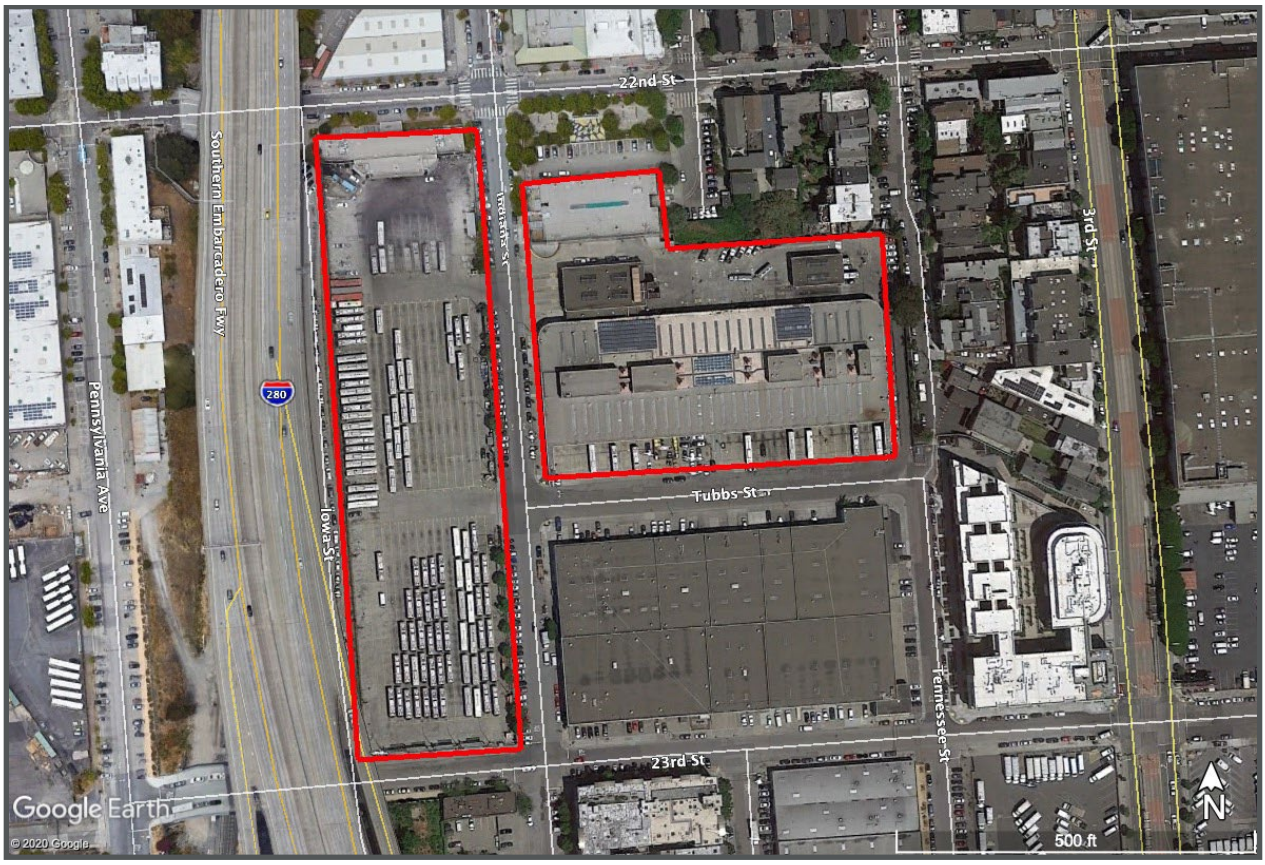
Currently, 221 (221 40-foot and 20 30-foot) diesel-hybrid buses are stored, maintained, fueled, and serviced at Kirkland Yard. The 20 30-foot buses are exclusively used for training purposes. Woods has the largest bus capacity in Muni's system and is of strategic importance in the overall Muni service plan. The yard includes the following separate structures and major site areas: a two-story maintenance building, two-story tire shop, stand-alone fuel building, and stand-alone wash building. The site is bisected from north to south by Indiana Street. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Indiana Street and are parked in unassigned, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lane. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked in a row of spaces along the northern site perimeter, between the fuel and wash areas.

As a result of BEB facility conversion scope and high cost of improvements and electrical upgrade, the SFMTA is analyzing a potential full rebuild and expansion of the Woods Yard following completion of Presidio Yard. Woods Yard is inefficient in its site design and the maintenance function limits it to only 40-foot buses, which constrains the SFMTA's overall maintenance flexibility. If a rebuild scenario moves forward for Woods Yard, the anticipated in-service date range would be between 2032-2035.

An aerial and site plan of Woods Yard are presented in Figure 4-16 and Figure 4-17, respectively.

Figure 4-16. Woods Yard - Existing Conditions (Aerial)



Source: Google Earth

Figure 4-17. Woods Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

If BEB infrastructure is integrated into the Woods Yard's existing layout, it will be capable of storing 233 total BEBs, of which, 177 can be charged (simultaneously). 158 can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional 19 buses can be charged in the maintenance bays via plug-in dispensers. It is assumed that not all assigned buses will be able to be charged concurrently. As buses finish charging, they should be moved to non-charging positions to allow the next bus to begin charging.

Woods Yard is also candidate for a full rebuild – an option that is still under study. It is assumed that if it is rebuilt, the proposed layout will be designed to charge the entire fleet, simultaneously.

Table 4-8 summarizes the ZEB infrastructure planned at Woods Yard.

Table 4-8. Woods Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	241
No. of BEBs Supported (2040)	233
No. of Charging Cabinets	90
No. of Dispensers/Charging Positions	177

Source : WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

The following BEB equipment and locations are proposed:

— 44 DC charging cabinets located primarily on a platform attached to the overhead support structure spanning the southern block of bus parking. These charging cabinets will distribute to 87 pantograph-charging positions mounted from overhead support structures over the existing main bus parking tracks and satellite spaces.

— 36 DC charging cabinets located primarily on a platform attached to the overhead support structure spanning the northern block of bus parking. These charging cabinets will distribute to 71 pantograph-charging positions mounted from overhead support structures over the existing main bus parking tracks and satellite spaces.

— The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

— In the maintenance building, 10 charging cabinets will be installed and connect to 19 dispensers. The dispensers will be mounted between every two bays. This will provide charging to 37 buses that cannot be charged in the main parking area.

The pantographs and charging cabinets will be served by the following electrical infrastructure:

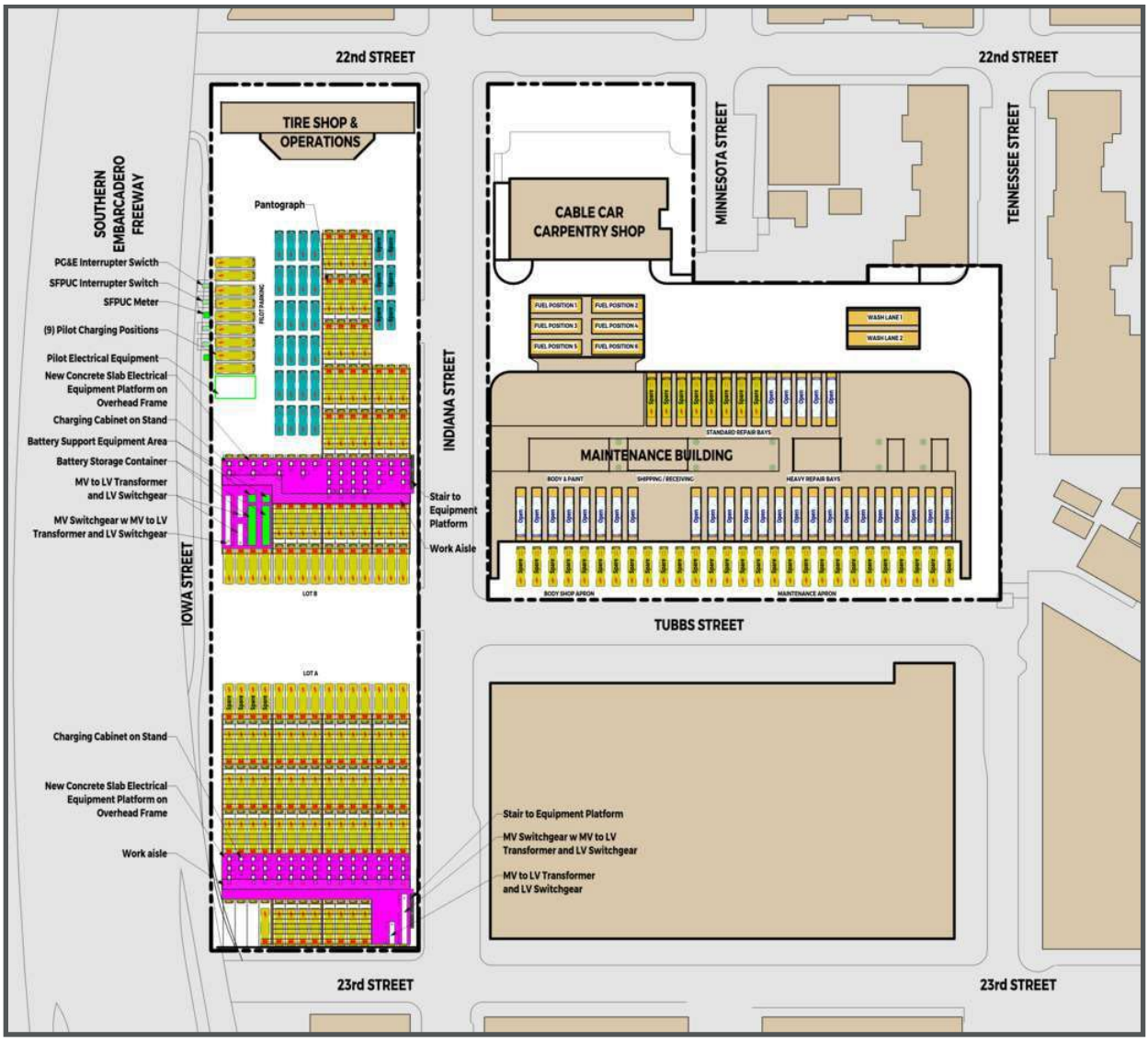
— Two interrupter switch pairs and two meters will be installed on the west side of the site along Iowa Street. The first interrupter in each pair will be owned and operated by PG&E, and the second interrupter in each pair as well as both meters will be owned and operated by SFPUC. Power will transition from the meters to the medium-voltage switchgear located on the two platforms located at the north end of the site and the south end of the site, above the bus parking.

— On the northern platform, one medium-voltage switchgear and three medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed. The switchgear and transformers will be exterior rated.

— On the southern platform, one medium-voltage switchgear and two medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed. The switchgear and transformers will be exterior rated.

Figure 4-18 illustrates the Woods Yard at full build-out.

Figure 4-18. Woods Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Woods Yard includes the installation of four new interrupter switches and two meters on the exterior of the facility along Iowa Street, routing the utility-provided power into the site along the eastern wall to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the northern block of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule.

5 Equity Considerations

The following section provides an overview of disadvantaged communities within the SFMTA's service area and information on how the SFMTA plans to ensure that zero-emission vehicles are prioritized in these communities.

5.1 Disadvantaged Communities

Disadvantaged communities (DACs) refer to areas that suffer the most from a combination of economic, health, and environmental burdens. The California Environmental Protection Agency (CalEPA) and California's Senate Bill 535, define a "disadvantaged" community as a community (census tract) that is located in the top 25th percentile of U.S. Census tracts identified by the results of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen uses environmental, health, and socioeconomic data to measure each census tract (community) in California. Each tract is assigned a score to gauge a community's pollution burden and socioeconomic vulnerability. A higher score indicates a more disadvantaged community, whereas a lower score indicates fewer disadvantages.

The replacement of DHEBs with BEBs will yield many benefits in the communities they serve, including a reduction of noise and harmful pollutants. Given that DACs are disproportionately exposed to these externalities, they should be considered and prioritized during initial deployments of BEBs. The SFMTA will ensure that equity and DACs are prioritized as yards are equipped with charging infrastructure and as buses are deployed on the yard's BEB-compatible blocks.

In addition to upcoming BEB deployments, the SFMTA specifically addresses equity through two focused initiatives: The Muni Service Equity Policy and the Green Zone project.

The SFMTA Service Equity Policy is a process to identify and correct transit performance disparities. The SFMTA has prepared three equity strategy reports since the policy was adopted in 2014. The 2016 Equity Strategy identified seven neighborhoods: Bayview, Chinatown, Excelsior/Outer Mission, Inner Mission, Tenderloin, Visitacion Valley, and Western Addition. The Oceanview/Ingleside neighborhood was added in the 2018 Equity Strategy, and Treasure Island was added in the 2020 Equity Strategy. The intent is that these neighborhoods see improvement equal to or better than the overall system.

The "Green Zone" project, initiated in 2019, utilizes existing technology that permits diesel-hybrid vehicles to run on full electric battery power in select neighborhoods with poor air quality. 68 of these vehicles have larger batteries and a GPS-enabled switch, which will cause the bus to automatically switch to EV mode as it enters geo-fenced areas (Green Zones) throughout the city. The geo-fenced zones were chosen to focus primarily on Muni Equity Strategy neighborhoods, those with high percentages of low-income households and people of color, and where respiratory illnesses occur at a disproportionate rate.

5.2 Summary of The SFMTA's DACs

To understand the potential benefits that ZEBs will provide to DACs in the SFMTA's service area, it is necessary to establish if (1) a yard is in a DAC, and (2) if its routes travel within or alongside a DAC boundary.

As shown in Table 5-1 and Figure 5-1, none of the SFMTA's bus yards are located within a DAC. However, routes that are served from each yard *do* serve DACs – Woods Yard serves the most DACs (12), which account for approximately 6% of all of its communities served. As noted above, several routes

are operated with buses from more than one garage, so a single route in a DAC could be served by multiple yards.

Table 5-1. The SFMTA's Disadvantaged Communities - Yard Summary

Yard	In DAC?	NOx Exempt Area?	Communities Served	DACs Served	Pct. Of DACs Served
Flynn	No	No	102	2	2%
Islais Creek	No	No	112	4	4%
Kirkland	No	No	120	5	4%
Potrero	No	No	74	2	3%
Presidio	No	No	92	4	6%
Woods	No	No	192	12	6%

Source: CalEnviroScreen 3.0

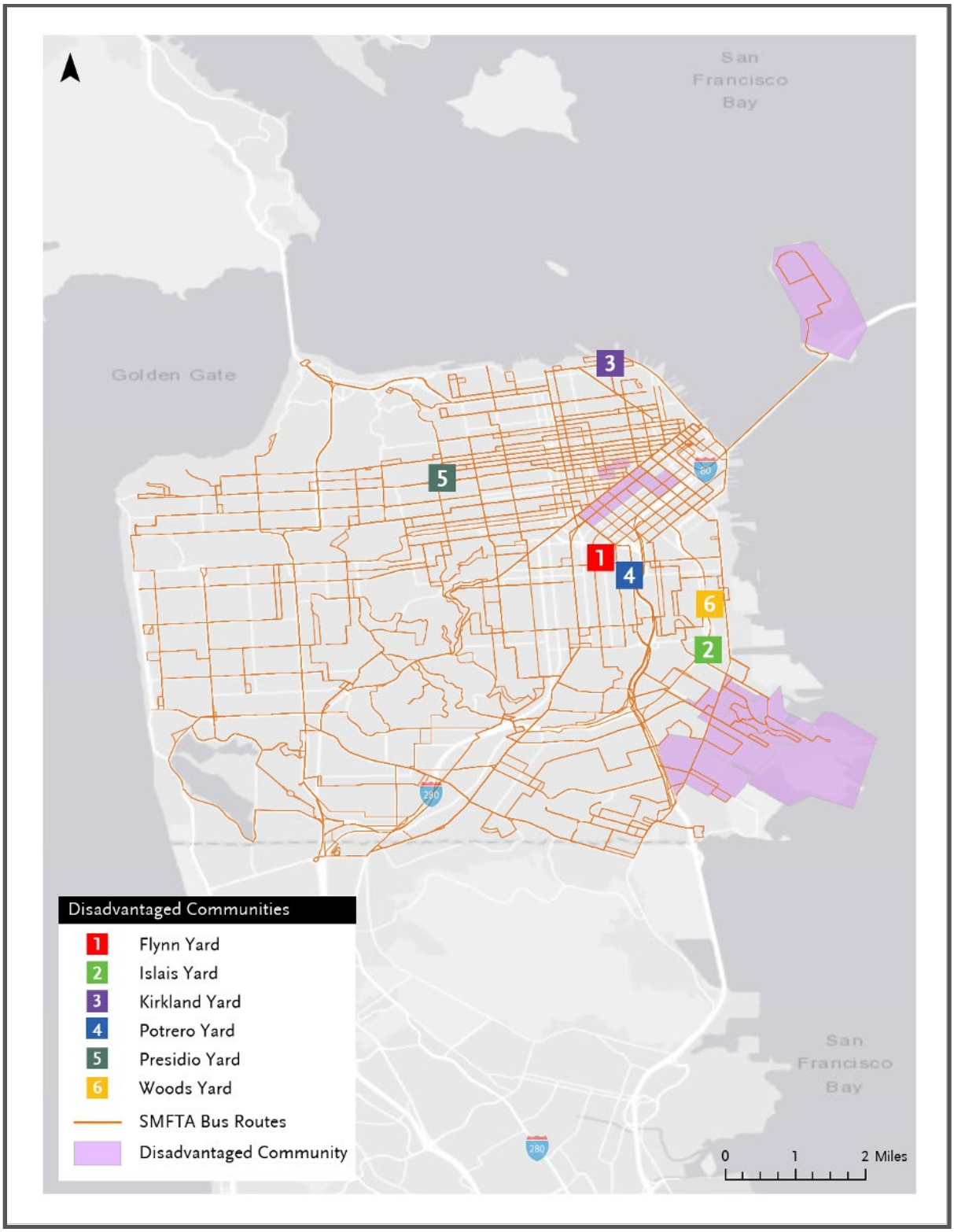
Table 5-2 details the number of DAC-serving routes by yard.

Table 5-2. The SFMTA's Disadvantaged Communities - Route Summary

Yard	No. of DAC Serving Routes	DAC Serving Routes
Flynn	5	9R, 14R, 14X, 38R, 714
Islais Creek	7	7, 7X, 8, 8AX, 8BX, 38, 714
Kirkland	6	12, 19, 30, 47, 81X, 83X
Potrero	5	5, 5R, 6, 14, 30,
Presidio	4	21, 24, 31, 45
Woods	22	5, 7, 7X, 9, 23, 25, 27, 29, 38, 44, 54, 81X, 83X, 91, K-OWL, L-OWL, N-OWL, JBUS, KTBUS, LBUS, MBUS, NBUS

Source: CalEnviroScreen 3.0

Figure 5-1. The SFMTA's Disadvantaged Communities and Bus Yards



Source: CalEnviroScreen 3.0

6 Workforce Training

The following section provides an overview of the SFMTA's plan to train personnel on the impending transition.

6.1 Training Requirements

The transition to an allzero-emissionfleet will significantly alter SFMTA's service and operations. Converting to BEBs from their existing DHEBs is logistically complicated and will impact all ranks of the organization.

Training for the operation, maintenance, and handling of BEBs will be conducted after bus procurement and in advance of delivery. Training conditions and schedules will be included in procurement documents, as they are with all existing procurements. For example, SFMTA has already procured nine buses for their pilot project (expected delivery in 2021).[14] Table 6-1 provides an example of training modules that are included with one of their procurements.

It is expected that all relevant personnel will be sufficiently trained before buses arrive. If other OEM-provided buses are procured in the future and/or if new components, software, or protocols are implemented, it is expected that SFMTA's staff will be trained well in advance of the commissioning of these additions.

Table 6-1. Zero-Emission Bus Training Modules (Sample)

Module	Hours
General Vehicle Orientation	8
Multiplex System	32
Entrance and Exit Doors	8
Wheelchair Ramp	4
Brake Systems and Axles	16 (8 per axle)
Air System and ABS	8
Front and Rear Suspension, Steering, and Kneeling	8
Body and structure	4
Propulsion & ESS Fam/HV Safety	24
Charging Equipment	4
Electric HVAC, AC Maintenance (Vendor Specific)	24
Propulsion & ESS Troubleshooting	16
Operator Orientation	8
Towing and Recovery	4

Source: SFMTA, 2019

The following provides a list of personnel and positions that will need to be retrained upon adoption of BEBs (this list is not exhaustive):

[14] Nine buses are currently procured with an additional three in negotiations.

- **Bus Operators and Supervisors**
  Bus operators and field supervision will need to be familiarized with the buses, safety, bus operations, and pantograph operations.

- **Facilities Maintenance Staff**
  Maintenance staff will need to be familiarized with scheduled and unscheduled repairs, high-voltage systems, and the specific maintenance and repair of equipment.

- **First Responders**
  Local fire station staff will need to be familiarized with the new buses and supporting facilities.

- **Tow Truck Service Providers**
  Tow truck providers will need to be familiarized with the new buses and proper procedures for towing ZEBs.

- **Mechanics**
  Mechanics will need to be familiarized with the safety-related features and other components of ZEBs.

- **Instructors**
  Maintenance and bus operator instructors will need to understand all aspects of the transition of ZEBs to train others.

- **Utility Service Workers**
  Staff will become familiarized with proper charging protocol and procedures that are ZEB-specific.

- **Management Staff**
  Maintenance and Operations managerial staff will be familiarized with ZEB operations and safety procedures.

7 Costs and Funding Opportunities

The following section identifies preliminary capital costs and potential funding sources that the SFMTA may pursue in its adoption of ZEBs.

7.1 Preliminary Capital Expenditure Costs

While costs for a full fleet transition are still being analyzed, it is estimated that the costs of chargers, pantographs, buses, and on-site construction, alone, will be in excess of $1.8B (2020 dollars). This estimate is based on a 1:1 bus replacement ratio. The following costs are excluded from the estimate:

- purchase of additional buses (due to range limitations)
- on-site battery storage or photovoltaics
- charge management software
- on-route charging infrastructure
- costs associated with the transition (i.e., temporary relocating and rerouting of service)

The estimate is only based on infrastructure *within* the SFMTA's property lines – it does not consider utility infrastructure enhancements that are required to energize the fleet (design, permitting, and construction of substations, circuits, etc.). The SFMTA has been advised by the SFPUC that it is most likely that PG&E will pass along the cost of any downstream improvements to the SFMTA, at a likely cost of several million dollars per site. Costs are variable and the SFPUC could not provide a per cost mile estimate due to site-specific factors such as age of existing infrastructure, location of existing electrical improvements, density of equipment within the utility vault, etc.

Furthermore, Potrero and Presidio yards (and likely Woods) are planned to be fully rebuilt. An August 2020 cost estimate for the Potrero Yard Modernization Project (bus facility component only) exceeds $406M, not including BEB supporting infrastructure. Prior to the ICT regulation, the current state of the facility has caused the SFMTA to reconsider the priority to rebuild Woods in advance of Kirkland. The SFMTA is still analyzing the facility sequencing and scope of work, with the cost of BEB improvements as a major factor in decision making. The costs associated with the demolition, staging, and construction at these existing sites is also not included with the capital cost estimate.

The cost for BEB improvements at each yard ranges from a low estimate of $130M (Kirkland) to a high of $406M (Potrero). The average capital cost per yard is approximately $303M.

The associated costs of a full fleet transition for each yard is provided in Table 7-1.

Table 7-1. Preliminary Bus and Charger Infrastructure (Only) Expenditure Estimates by Yard

Yard	Buses	Charging Infrastructure (Only)	Total
Flynn	$174.4M	$65.5M	$239.9M
Islais Creek	$236.8M	$83.0M	$319.8M
Kirkland	$101.3M	$28.7M	$130.0M
Potrero	$303.4M	$102.6M	$406.0M
Presidio	$272.3M	$81.8M	$353.1M
Woods	$286.4M	$86.4M	$372.8M
Total	$1.4B	$448M	$1.8B

Source: WSP
Notes: These estimates do not reflect the full facility upgrades required which are highly variable based on state of repair, location, etc. Pending further analysis, there will likely be additional capital improvements and costs to ensure a successful zero-emission vehicle operation, including battery storage, photovoltaics, additional vehicles, contingency components, utility enhancements, etc.
-Rounded to the nearest tenth.

7.2 Potential Funding Sources

There are a number of potential federal, state, local, and project-specific funding and financing sources that may be available to the SFMTA. The SFMTA will monitor funding cycles and pursue opportunities that yield the most benefits for the agency pursuant to the ICT regulation. Table 7-2 identifies the many funding opportunities that the SFMTA may take advantage of in the next 20 years.

Table 7-2. ZEB Funding Opportunities

Type	Agency	Funding Mechanism
Federal	United States Department of Transportation (USDOT)	Better Utilizing Investments to Leverage Development (BUILD) Grants
	FTA	Capital Investment Grants – New Starts
		Capital Investment Grants – Small Starts
		Bus and Bus Facilities Discretionary Grant
		Low- or No-Emission Vehicle Grant
		Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning
		Urbanized Area Formula Grants
		State of Good Repair Grants
		Flexible Funding Program – Surface Transportation Block Grant Program
	Federal Highway Administration (FHWA)	Congestion Mitigation and Air Quality Improvement Program

Type	Agency	Funding Mechanism
	Environmental Protection Agency (EPA)	Environmental Justice Collaborative Program-Solving Cooperative Agreement Program
	Department of Energy (DOE)	Design Intelligence Fostering Formidable Energy Reduction and Enabling Novel Totally Impactful Advanced Technology Enhancements
State	CARB	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)
		State Volkswagen Settlement Mitigation
		Carl Moyer Memorial Air Quality Standards Attainment Program
		Cap-and-Trade Funding
	California Transportation Commission (CTC)	Solution for Congested Corridor Programs (SCCP)
	Caltrans	Low Carbon Transit Operations Program (LCTOP)
		Transportation Development Act
		Transit and Intercity Rail Capital Program
		Transportation Development Credits
		New Employment Credit
Local and Project-Specific		Joint Development
		Parking Fees
		Tax Rebates and Reimbursements
		Enhanced Infrastructure Financing Districts
		Opportunity Zones

Source: WSP

8 Start-Up and Scale-Up Challenges

The SFMTA is an industry leader in implementing clean fleets and we share the California Air Resource Board's (CARB) vision to mitigate the impacts of climate change. The transportation sector is San Francisco's largest contributor to the city's overall carbon footprint. As the biggest source of greenhouse gas emissions, it makes up nearly half of all citywide emissions. The pollutants from cars, trucks and other private vehicles account for more than 70% of transportation emissions, while public transportation accounts for only 5% of transportation emissions. SFMTA's transit fleet accounts for less than 2% of public transportation emissions (which is less than .01% of the city's overall greenhouse gas emissions). Our initial analysis identifies significant challenges to further reducing our 2% share of emissions via a full ZE transition by 2040. These include time constraints, unpredictable advancements in ZE technology that could risk transit performance and service reliability, and significant capital, operational, and ongoing maintenance costs while our budget remains impacted by the COVID-19 pandemic. The following list of challenges is not exhaustive, and the SFMTA would like to explore with CARB the additional risks and complications to the ICT regulation.

- **Uncertainty of COVID-19.** COVID-19 has impacted all facets of our global economy, and transit is not an exclusion. During the pandemic, the SFMTA's ridership has plummeted and caused major shortfalls in revenue, resulting in impacts to both capital programs and operations. In addition, a global economic recession that came about with almost no warning is worsening as the COVID-19 crisis persists. At this time, it is unclear what the long-term impacts will be on service. There is a possibility that service ridership levels may not return to previous levels, resulting in changes to procurement and funding. As we look towards our recovery, we believe our limited resources are best used in retaining and growing our ridership. By prioritizing our commitment to providing reliable, high-frequency buses, we will improve environmental conditions at a lower cost than total fleet conversion While current CARB fleet conversion goals will help us further reduce, we believe high quality service is the key to even greater emissions reductions. The SFMTA will continue to analyze trends to determine service changes and plans.

- **Rapid Technological Advancement.** The SFMTA is currently planning for a transition based on the fleet as of September 2020 (with January 2020 service, pre-COVID). The SFMTA will soon need to make decisions on fleet requirements and it is difficult to anticipate future technological changes, such as improved batteries and chargers. The SFMTA (and the market) will have to make decisions to purchase fleets based on what is known at the time of the contract. This exposes the SFMTA to a risk of missing out on improvements that come soon after contract execution, rendering purchased technologies outdated on arrival.

- **Insufficient BEB Performance and Range.** The BEB industry is constantly innovating and developing vehicles with longer ranges and more efficient batteries. However, the SFMTA's analysis currently shows some service blocks that cannot be completed under existing technologies, particularly the hilliest routes. Unless battery technologies evolve, the SFMTA will have to spend additional monies to meet range requirements due to OEM's inability to develop better performing batteries.

- **Resiliency and Emergency Response.** The SFMTA is also seeking solutions to address resiliency and emergency response within the context of a zero-emission fleet. Service that is dependent on electricity is vulnerable during outages and emergencies. In addition, the SFMTA provides regional emergency responses and high-capacity evacuation for wildfires, which would be challenging to do with reduced bus ranges, such as zero-emission vehicles. Thus, the SFMTA is considering retaining

a DHEB sub fleet for these rare occasions, although we acknowledge this fleet would not be CARB-compliant.

- **High Capital and O&M Costs.** To maintain pre-COVID-19 service with BEBs (with existing technologies), the SFMTA would need more vehicles (more than a 1:1 replacement ratio). The SFMTA's facilities are at crush capacity and cannot accommodate even 10% more vehicles. Therefore, to convert with current technologies, the SFMTA would have to acquire additional real estate and build new facilities, which is a daunting and extremely expensive endeavor. Additionally, the SFMTA's buses operate on some of the steepest grades in the US. The gradeability will require the SFMTA to purchase extended warranties (likely 12-year) which increases the purchase price of each bus, and it can also lead to more expensive midlife overhaul costs – further ballooning the lifecycle costs of the transition.

- **Uncertain Capital Funding Streams in a Major Economic Recession.** Adoption of BEBs has many benefits, including potential lifecycle cost savings. However, the investment required for capital and change management is significant. In an increasingly constrained funding environment, and with little to no operating reserves due to the recession induced by COVID-19, the SFMTA does not have funds for these capital projects if specific funding streams are not identified through other resources. The conversion of the SFMTA's bus facilities to accommodate BEBs is especially complex, particularly given the 2040 time horizon. Like much of United States' public infrastructure, the SFMTA is faced with aged, obsolete facilities and significant deferred maintenance due to decades without flexible facility funding. The SFMTA's Building Progress Program, a facility capital renewal program, aims to strategically address this state of disrepair by rebuilding the SFMTA's oldest and most obsolete facilities. This ambitious and billion-dollar program includes BEB adaptability of two yards but leaves four with no funding framework for the significant modifications that BEB requires.

  To electrify the full fleet by 2040, SFMTA would need to have multiple yards undergoing construction concurrently. In addition, the high cost of the improvement requires a cost-benefit analysis of making BEB improvements without addressing existing condition of the facilities. For at least two facilities (Kirkland and Woods), BEB conversion without complete rebuild of the sites is not fiscally responsible. This clearly adds additional budget, schedule, and risk complexity to the BEB conversion decision matrix.

- **Strains on Market Supply.** The ICT regulation will put a lot of pressure on OEMs to produce ZEBs at unprecedented rates. However, it is not only California that is interested in converting to ZEBs. These monumental policy changes make it challenging to meet ZEB goals for agencies if the supply of buses cannot meet demand. This may cause strains on supply, resulting in risk to meeting purchase requirement deadlines. If the supply industry cannot keep up and we end up with a less reliable vehicle, this could suppress transit use and not meet program goals. We cannot go electric if vehicles are not reliable.

- **Transition Complexity**. Maintaining service and adhering to ICT regulation purchase requirements, all while managing on-site construction, facility rebuilds, temporary bus relocations, bus procurements, and utility enhancements introduces a lot of risk to the SFMTA's program. If one element of this transition doesn't go as planned, there will be implications for other components of the program.

- **Dependence on SFPUC and PG&E Enhancements**. All of the SFMTA's yards will require additional electrical service and infrastructure. Installation of the support structure and charging equipment (chargers, switchgear, transformer, etc.) will impact transit operations. To date, PG&E has not

provided a path for the SFMTA to collaborate on planning for electrical service enhancement at the SFMTA bus yards, despite the San Francisco Public Utilities Commission's (SFPUC) persistence. Additionally, it is anticipated that utility infrastructure enhancements will also need to occur outside of the SFMTA's property lines, which may require for upstream improvements to the power grid. Current cost estimates do not consider these improvements, and the SFMTA has been advised by the SFPUC that PG&E will most likely pass these costs to the SFMTA at the likely cost of several million dollars per site.

- **Additional Strain on PG&E Resources.** Further complicating the SFMTA's dependency on PG&E coordination is the State's competing policies, programs, and regulation of other electric fleets, including commercial fleets and private vehicles. As State transportation electrification efforts take hold, PG&E will be incentivized to address the needs of rate-paying customers first. The SFMTA anticipates that commercial rate-paying customers will be prioritized over the SFMTA (as a wholesale customer).

- **The Results of the SFPUC Power Rate Study.** The SFPUC is currently undertaking an analysis of their rate structure. The SFMTA currently pays a wholesale distribution rate and receives power to its traction power system and facilities at very favorable rates. The outcome of this study and any resulting rate change impacts the SFMTA's cost to convert from DHEB to BEB.

- **Managing Power Demand**. The transition to BEBs will require strategies to ensure that the SFMTA can utilize power in the most efficient way. The SFMTA is coordinating with utility providers to determine methods to reduce peak demands. However, managing demand may also come at a hefty capital cost, something that staff is currently analyzing.

Project Name and Sponsor			
Project Name:	Muni Metro Stations Condition Assessment (Embarcadero to West Portal)		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The proposed project is to complete condition assessment of nine Muni Metro subway stations from Embarcadero to West Portal to address deferred subway station maintenance issues. The condition assessment will consider the structural, mechanical, and electrical components of each subway station. Work products will include an independent, prioritized review of deficiencies, estimates of repair options and comprehensive work plan and program. The SFMTA must determine and develop a clear program of improvements to keep this infrastructure in a state of good repair. Requested funds are to cover a cost increase to complete the scope of work.		
Project Location and Limits:	Muni Metro Stations at West Portal, Forest Hill, Castro, Church, Van Ness, Civic Center, Powell, Montgomery, and Embarcadero		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	N/A	**Is the project located in an Equity Priority Community (EPC)?**	Yes
Which EPC(s) is the project located in?	Tenderloin		
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	As part of the SFMTA's Asset Management Program, the SFMTA produces its annual State of Good Repair report, which analyzes the total value of SFMTA assets as well as the condition of these asset classes. A key component of the report is to show the value of assets in "backlog," or those assets based on an age-based condition score are beyond their planned useful life. In 2016, the SFMTA completed a condition assessment of all of its buildings and grounds, this was a key component in the development of its Building Progress Program. In 2020, the SFMTA began and recently completed its condition assessment of its Traffic Signals. The SFMTA will now complete a condition assessment of one of its largest asset classes, Stations. The proposed project is to complete condition assessment of nine Muni Metro subway stations from Embarcadero to West Portal and address deferred subway station maintenance issues. The condition assessment will consider the structural, mechanical, and electrical components of each subway station. Work products will include an independent, prioritized review of deficiencies, estimates of repair options, and a comprehensive work plan and program. The program will then be used for the development of specific capitalized maintenance campaigns and capital improvement projects, either for competitive grants for funding allocation as part of the SFMTA's 5-year capital improvement program. The data will also be used to update the capital needs of the SFMTA in its 20 year capital plan and the City and County of San Francisco's 10-year Capital Plan. In order to facilitate a mode shift to public transportation and reduce Green House Gas Emmissions, Muni Metro Stations must be in a State of Good repair. The Muni Metro Stations need to be safe, inviting, and reliable so that the general public will want to use public transportation to get them to where they want to go. In 2023, the Transportation Authority programmed $750,000 in Prop L funds to this project. SFMTA has since reconciled the project scope and cost in an RFP that it initiated in 2022, which was the basis for the original Prop L programming request, and recent discussions with consulting firms. The 2022 RFP assumed a $460,000 contract, while the revised cost estimate shows a $1.3M contract and $200,000 for SFMTA project management, resulting in a new total cost of $1.5M. SFMTA staff have revised the cost estimate from $750,000 to $1.5 million, which has led the project team to request the additional $750,000. The SFMTA's Muni Metro Subway tunnels and stations were constructed by BART in the 1960s and early 1970s, and are owned by BART (except Forest Hill Station). No major improvement projects have been done in the Muni Metro stations on the restrooms sump pumps, Station Agent booths, Custodians' rooms, break rooms, mechanical systems, HVAC, fire life safety, plumbing, electrical in the ~ 50+-year-old stations.		

Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	
Type of Environmental Clearance Required:	N/A
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	N/A

Project Delivery Milestones	**Status**	**Work**	**Start Date**		**End Date**	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	0%	In-house and Contracted	Q3-Jan-Feb-Mar	2024/25	Q1-Jul-Aug-Sept	2027/28
Environmental Studies (PA&ED)						
Right of Way						
Design Engineering (PS&E)						
Advertise Construction						
Start Construction (e.g. Award Contract)						
Operations (i.e. paratransit)						
Open for Use						
Project Completion (means last eligible expenditure)						

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Muni Metro Stations Condition Assessment (Embarcadero to West Portal)

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 1,500,000	$ 1,500,000	$ -	Engineer's estimate
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ -	$ -	$ -	
Construction	$ -	$ -	$ -	
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 1,500,000	$ 1,500,000	$ -	
Percent of Total		**100%**	**0%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Planning/Conceptual Engineering	Planned	2024/25	$ 750,000	$ -		$ 300,000	$ 300,000	$ 150,000
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Planning/Conceptual Engineering	Programmed	2023/24	$ 750,000	$ -	$ 200,000	$ 400,000	$ 150,000	$ -
				Total By Fiscal Year	**$ 1,500,000**	**$ -**	**$ 200,000**	**$ 700,000**	**$ 450,000**	**$ 150,000**

Notes

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Muni Metro Stations Condition Assessment (Embarcadero to West Portal)***
Relative Level of Need or Urgency (time sensitive)	In 2016, the SFMTA completed its full condition assessment of its Buildings and Grounds, and in 2023 the SFMTA completed its condition assessment of Traffic Signal Infrastructure. In 2024, the SFMTA will be initiating a contract as part of its Asset Management Program of completing a condition assessment of its station infrastructure. Stations represent more than $2 billion of assets, and cannot be reconstructed. The SFMTA must determine and develop a clear program of improvements to keep this infrastructure in a state of good repair. It is important to get the Muni Metro Stations assessed for what is in the stations and a methodology developed so that a plan of action can be created to address the deficiencies.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	The SFMTA prepares an annual State of Good Repair report that is presented to the SFMTA Board of Directors. As part of this report, the capital assets by the agency are shown with related total asset replacement cost, and total assets that are beyond their useful life, or in backlog. All related work in this area can be found here: https://www.sfmta.com/asset-management-program
Benefits to Disadvantaged Populations and Equity Priority Communities	This project is meant to ensure that SFMTA transportation capital assets can remain in a State of Good Repair. This impacts all neighborhoods, residents and visitors to the City and County of San Francisco. The Powell, Civic Center, and Van Ness Stations are located in equity neighborhoods. These areas not only house a large population of homeless, but its some of the more widely used stations due to their proximity to tourist attractions as well as entertainment ares of the city. It is imperative to have these stations be assessed and review what areas are in need of repair/replacement so that the population that live in that area and tourist can access and use the transportation that is serviced in the stations and the area. The assessment will help prioritize the needs.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Safety and Livability, Economic Vitality
	A key element and first priority for funding in the SFTP was State of Good Repair of existing transportation assets. As well, as Muni's main subway trunk line Metro is a key economic driver of downtown's recovery.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	Stations are the first point of contact for riders of the Muni Metro in addition to surface stops and platforms. They need to be safe and in clean working order for passengers - elevators and escalators need to function, heating and ventiliation systems needs to function as well as all safety and security systems. This project evaluates all of the supporting systems to ensure that Muni Metro Stations are fully functional for the riding public.
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	This project addresses a key need in the SFMTA's State of Good Repair report as being one of the highest assets in backlog, requiring capital investment. A first step is to complete a comprehensive condition assessment.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	Conducting a condition assessment on SFMTA stations will help the agency keep it's stations in a state of good repair which will keep the stations safe for the public and transit operators as well as improve transit optimization because of reduced risk failure of it's underlying systems and infrastructure that allows the public to use the system.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Potrero Yard Modernization		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06b- Facilities and Guideways		
Second Prop L Program (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The Potrero Modernization Project will rebuild the Potrero Transit Division from the ground up - replacing a 1915 building that last received major renovations in 1950 when it was converted to a trolleybus division. The new multi-floor facility will increase capacity from 93-60' and 45-40' trolleybuses to 213 60' and 40' trolleybuses. Joint development includes construction of up to 513 residential units adjacent and above, including ground floor commercial/active use along Bryant, 17th and Hampshire Streets.		
Project Location and Limits:	2500 Mariposa Street (square block bounded by Mariposa, Bryant, Hampshire, and 17th Streets. Limits of impact = city-wide on all bus routes that operate from the facility.		
Supervisorial District(s):	Citywide, District 09		
Is the project located on the 2022 Vision Zero High Injury Network ?	No	**Is the project located in an Equity Priority Community (EPC)?**	No
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	The purpose of the project is to rebuild, expand, and modernize the Potrero Yard Muni Bus Maintenance Facility located at 2500 Mariposa Street, and replace it with a three-story bus facility with housing adjacent to and above the base building podium. The project will reconstruct and expand the Potrero Yard Muni Bus Maintenance Facility, including a partial basement for loading and lower floor work areas, totaling approximately 698,687 gross square feet of public transit use, and to construct 513 residential units adjacent and above, including ground floor commercial/active use along Bryant, 17th and Hampshire Streets. Total square footage range of the development is estimated at 1,006,863 gross square feet. Public-Private Partnership Project Delivery Model * Project split into 3 parts: 1) Bus Yard, 2) Housing and Commercial, 3) Common infrastructure * Infrastructure developer partner to design, build, finance and maintain new facility, operate housing, and maintain common building elements * DBFM: Finance and maintain components are critical for the SFMTA * Risk transfer to well capitalized partner who can better manage financing and interface between project components * Improved speed to market through approach to design and contractual incentives Timeline * 2018-21 - Predevelopment, DEIR process, public outreach * 2022 - Continued predevelopment, public outreach * 2023-24 - Continuing predevelopment, FEIR, public outreach, project agreement / financing * 2024-27 - Relocation of existing yard vehicles and staff, construction of new facility		

* 2027 - Project complete - new division opens

The SFMTA launched the Building Progress Program in Fall 2017.
The Building Progress Program will:
* Modernize aging SFMTA facilities in order to meet the needs of everyone who travels in San Francisco;
* Improve the transportation system's resiliency to seismic events, climate change, technology changes; and
* Make the SFMTA a better neighbor in the parts of the city that currently host our facilities.

A Look at Potrero Yard
Before Covid 19 - 102,000 Muni riders rely on buses from Portero Yard (14% of all Muni riders)
Existing Facility: 2 levels/138 buses/16 bus bays/391 staff
Future Facility: 3 levels/213 buses/17 bus bays/892 staff

Core Transportation Objectives
* Rebuild and modernize Potrero Yard by 2027
* Successfully relocate and move Potrero Yard functions to other SFMTA locations for duration of the rebuild and modernization activities
* Provide infrastructure for battery electric (BEB) buses
* Improve safety and working conditions for SFMTA workers
* Consolidate functions for efficiencies (Training + Street Ops Mgmt.)

Site / Housing Objectives
* Enhance architecture and urban design
* Enhance streetscape to ensure public safety and reduce conflicts
* Maximize housing, including at least 50% affordable and up to 100% affordable

Commitment to:
* A responsible public investment, inclusive and transparent stakeholder engagement, and leadership in sustainability

Stakeholder Engagement
* Stakeholder engagement began in 2017
* Five major public events held in 2018-21
* Virtual meetings during COVID
* Live events return late 2021 - tabling events - continue into 2023
* Public yard tours begin again in 2021 - continue into 2023

Public Works Funding for Project Activities
The SFMTA has to pay the Potrero Modernization Project P3 developer $4.35M after approval of the FEIR and entitlements in January 2024, and $9.99M is needed to finalize and get approval of the Project Agreement and move into construction with the help of multiple City departments and outside consultants in 2024. The payment of $4.35M was approved by the SFMTA Board at their meeting on 11/1/22 and RESOLUTION No. 221101-105 was provided to the SFCTA as part of the Prop L funding request. Other funding is requested from RM 3 through MTC, and the funding allocation was submitted.

From the SFMTA's Potrero Project there have been Lessons Learned re: the complexities and funding challenges of building a new bus and transit facility with housing proposed adjacent and above on the 4.4 acre parcel. There are many issues re: coordinating the planning, financing, and construction of the bus facility versus housing and other commercial uses. For the Presidio Project on the 5.4 acre parcel, the SFMTA is proposing to subdivide it into two parcels: the larger parcel for the bus facility, other transit and transit uses, and a pedestrian crossing; the other parcel for residential and mixed use

	development. The two projects can coordinate and move forward with their planning, funding, predevelopment, and construction schedules.
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Attachment 1: Predevelopment Agreement Attachment 2: Potrero Yard Neighborhood Working Group Presentation (March 2023) Attachment 3: Potrero Yard Neighborhood Working Group Presentation (July 2023)
Type of Environmental Clearance Required:	EIR
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	San Francisco Public Works - Tim Kempf, Project Mgr. IV

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	85%	In-house and Contracted	Q2-Oct-Nov-Dec	2018/19	Q2-Oct-Nov-Dec	2023/24
Environmental Studies (PA&ED)	90%	In-house and Contracted	Q2-Oct-Nov-Dec	2018/19	Q3-Jan-Feb-Mar	2023/24
Right of Way	N/A	TBD				
Design Engineering (PS&E)	30%	In-house and Contracted	Q2-Oct-Nov-Dec	2018/19	Q4-Apr-May-Jun	2024/25
Advertise Construction	5%	Contracted	Q3-Jan-Feb-Mar	2023/24		
Start Construction (e.g. Award Contract)	0%	Contracted	Q2-Oct-Nov-Dec	2024/25		
Operations (i.e. paratransit)	0%	Contracted	Q2-Oct-Nov-Dec	2027/28	Q2-Oct-Nov-Dec	2027/28
Open for Use	0%	In-house and Contracted			Q2-Oct-Nov-Dec	2027/28
Project Completion (means last eligible expenditure)	0%	In-house and Contracted			Q2-Oct-Nov-Dec	2027/28

Notes

- Note that this project only accounts for the city costs related to the project, as the construction phases of the project are under negotiation and are anticipated to be financed.
- Contract is Design/Build so advertisement for construction is at the same time as Design.
- SFMTA Board approved the Predevelopment Agreement (PDA) – 11/1/22
- PDA – 50% Design, 100% Schematic Design of the Bus Facility – 2023
- Final EIR and entitlements approvals – January -February 2024
- Commercial Close (end of PDA phase), execution of Project Agreement - Summer 2024
- Construction of the Bus Facility – 2024-2027
- $12.5 M is needed for: $4.35 M in January - February 2024 to pay PNC $4.35 M, as approved by SFMTA Board 11/1/22; the remainder is needed to complete the PA and begin construction

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Potrero Yard Modernization

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 8,810,366	$ -	$8,810,366	SF City rates
Environmental Studies (PA&ED)	$ 2,750,000	$ -	$2,750,000	RFP for EIR
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 35,724,272	$ 12,500,000	$ 23,224,272	Developer Estimate
Construction	$ 444,197,277	$ -	$ 444,197,277	City Original Estimate
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 491,481,915	$ 12,500,000	$ 478,981,915	
Percent of Total		**3%**	**97%**	

* $5,773,403 of Other is Prop K sales tax

* Including Prop K, sales tax is 4% of the total

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
Prop K		Planning/Conceptual Engineering	Allocated	2020/21	$ 5,773,403	$ -	$ -	$ -	$ -	$ -
SFMTA Capital Funds		Planning/Conceptual Engineering	Allocated	2022/23	$ 5,786,963	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Design Engineering (PS&E)	Planned	2023/24	$ 12,500,000	$ -	$ 2,500,000	$ 1,850,000	$ 4,075,000	$ 4,075,000
Developer Costs		Design Engineering (PS&E)	Allocated	2022/23	$ 19,694,217	$ -	$ -	$ -	$ -	$ -
RM3		Design Engineering (PS&E)	Programmed	2023/24	$ 3,503,055	$ -	$ -	$ -	$ -	$ -
RM3		Construction	Programmed	2026/27	$ 25,000,000	$ -	$ -	$ -	$ -	$ -
SB1		Design Engineering (PS&E)	Programmed	2023/24	$ 27,000	$ -	$ -	$ -	$ -	$ -
TBD (SFMTA FACILITY OPS, PROP B, TSF, SB1, FUTURE GO Bond)		Construction	Planned	TBD	$ 419,197,277	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 491,481,915**	**$ -**	**$ 2,500,000**	**$ 1,850,000**	**$ 4,075,000**	**$ 4,075,000**

Notes

This is a design/build project. Construction is anticipated to be paid via annual availability payment. Current costs reflect the original city estimate for the Bus Yard Component of the project (BYC).

TA Use Only

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Potrero Yard Modernization***
Relative Level of Need or Urgency (time sensitive)	This project is an urgent need and is part of the SFMTA's Building Progress Program. If the funding is not received, the project will be delayed, holding up the other electric bus projects, which have deadlines from the Calif. Air Resources Board (CARB). The facility is over 110 years old, and its continued operation is critical for transit operations at SFMTA. It is so critical, that while the project is being built, many trolley buses that are located at this facility will be sent (along with operators and maintenance staff) to other divisions, so they can continue in active service. Funding is needed to relocate staff and buses to various locations with the help of relocation consultant and movers. The Potrero Modernization Project is the third major project of the Building Progress program that will rebuild multiple SFMTA facility structures over the next decade and beyond for the next 100 years. The CARB compliance for full transition to ZEB is by 2040.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	The Potrero Working Group has had meetings since 2018, which continue monthly in 2023. Tours of the facility open to the public, neighbors, community groups have been offered since 2018. Much information on the project is available online. sfmta.com/projects/potrero-yard-modernization-project sfmta.com/committees/potrero-yard-neighborhood-working-group
Benefits to Disadvantaged Populations and Equity Priority Communities	The transit service that originates at the Potrero Division is operated to all parts of San Francisco - serving multiple equity priority communities. The trolley buses that operate from the Potrero Division serve 14 routes that reach all parts of the city, including several disadvantaged neighborhoods. Pre-Covid these buses carried an average of 102,000 passengers per day providing mobility on journey to work trips, medical trips, school trips, recreation trips and other trips. The investment in a new facility is expected to benefit all of San Francisco.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Equity, Environmental Sustainability, Economic Vitality, Safety and Livability
	The trolleybuses that operate from the Potrero Division serve 14 routes that reach all parts of the city, including several disadvantaged neighborhoods. Pre-Covid these buses carried an average of 102,000 passengers per day providing mobility on journey to work trips, medical trips, school trips, recreation trips and other trips. The investment in a new facility is expected to benefit all of San Francisco for the next 100+ years.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	Yes - the project will replace a 110+ year old building that is too small, not configured for modern transit vehicles, and which has obsolete and outmoded building systems (HVAC, electrical, plumbing, etc.), and which has seismic concerns if a major earthquake were to occur.
Need (Asset Useful Life) (Vehicles Sub-program)	N/A
Improves Efficiency of Transit Operations (Vehicles Sub-program)	N/A
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	Yes - the project will replace a 110+ year old building that is too small, not configured for modern transit vehicles, and which has obsolete and outmoded building systems (HVAC, electrical, plumbing, etc.), and which has seismic concerns if a major earthquake were to occur.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	Yes - the project will replace a 110+ year old building that is too small and which is not configured for modern transit vehicles. The new facility will reflect the changes to vehicles over the past several decades. Staff will have better working conditions, better HVAC, better restrooms, new lactation rooms, a wellness - health - exercise room, etc. Residential units will be located adjacent to and above the facility.
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THIS PRINT COVERS CALENDAR ITEM NO.: 11B

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

DIVISION: Finance and Information Technology

BRIEF DESCRIPTION:
Authorizing the Director of Transportation to execute a Predevelopment Agreement with Potrero Neighborhood Collective, LLC, for the Potrero Yard Modernization Project, with a term that will not exceed 568 days, a potential termination payment that will not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,350,000.

SUMMARY:
- The Potrero Yard Modernization Project (Project) will replace the existing Potrero Yard with a new facility (Facility) comprised of a modern bus storage and maintenance component (Bus Yard Component) and, if feasible, a multi-family housing and commercial component (Housing Component).
- On April 9, 2021, a Request for Proposals for the Project (RFP) was released to three teams that were short-listed through an earlier Request for Qualifications. After receiving timely proposals from all three by December 30, 2021, the SFMTA determined that two of the short-listed teams were responsive to the RFP requirements and passed (Qualified Proposers).
- On March 1, 2022, the SFMTA Board of Directors adopted Resolution 220301-017 to approve the form of predevelopment agreement (Form Agreement) for the Project, with a term that would not exceed 568 days, a potential termination payment that would not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,000,000.
- On May 26, 2022, the SFMTA exercised its RFP right to request proposal revisions (Proposal Revisions) from the Qualified Proposers to ultimately receive proposals that provided the best value for the Project and the City. As part of the Proposal Revisions process, the SFMTA increased the Form Agreement continuation payment to $4,350,000.
- On July 26, 2022, a single Proposal Revision was received from the Potrero Neighborhood Collective (PNC), with Plenary Americas US Holdings Inc. (Plenary) as its controlling equity member. After extensive evaluation of the submitted Proposal Revision, PNC was named the selected preferred proposer.
- As permitted in the RFP, PNC formed the Potrero Neighborhood Collective, LLC (Lead Developer) to enter into the Form Agreement, modified to include the PNC proposal details and commitments and a $4,350,000 contribution payment (Final PDA). Plenary is the sole member of the Lead Developer and will guaranty the Lead Developer's performance under the Final PDA.

ENCLOSURES:
1. SFMTAB Resolution
2. Potrero Yard Modernization Project Predevelopment Agreement

APPROVALS: **DATE**
DIRECTOR _____ October 27, 2022

SECRETARY _____ October 27, 2022

ASSIGNED SFMTAB CALENDAR DATE: November 1, 2022

PURPOSE

Authorizing the Director of Transportation to execute a Predevelopment Agreement (PDA) with Potrero Neighborhood Collective, LLC (Lead Developer) for the Potrero Yard Modernization Project (Project), with a term that will not exceed 568 days, a potential termination payment that will not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,350,000.

STRATEGIC PLAN GOALS AND TRANSIT FIRST POLICY PRINCIPLES

This action is consistent with the following goals in the San Francisco Municipal Transportation Agency (SFMTA) Strategic Plan, by efficiently providing the SFMTA with a new electric bus maintenance facility and modernizing maintenance technologies. Specifically, this action will deliver on the following goals:

- Goal 5: Deliver reliable and equitable transportation services.
- Goal 6: Eliminate pollution and greenhouse gas emissions by increasing use of transit, walking and bicycling.
- Goal 8: Deliver quality projects on-time and on-budget.
- Goal 9: Fix things before they break and modernize systems and infrastructure.
- Goal 10: Position the agency for financial success.

The SFMTA will further the following Transit First Policy Principles by initiating the delivery of a major new bus maintenance and storage facility:

1. To ensure quality of life and economic health in San Francisco, the primary objective of the transportation system must be the safe and efficient movement of people and goods.
2. Public transit, including taxis and vanpools, is an economically and environmentally sound alternative to transportation by individual automobiles. Within San Francisco, travel by public transit, by bicycle and on foot must be an attractive alternative to travel by private automobile.
8. New transportation investment should be allocated to meet the demand for public transit generated by new public and private commercial and residential developments.
9. The ability of the City and County to reduce traffic congestion depends on the adequacy of regional public transportation. The City and County shall promote the use of regional mass transit and the continued development of an integrated, reliable, regional public transportation system.
10. The City and County shall encourage innovative solutions to meet public transportation needs wherever possible and where the provision of such service will not adversely affect the service provided by the Municipal Railway.

DESCRIPTION

Project Background

The SFMTA's Building Progress Program (Program), $1.2 billion multi-year effort, to repair, renovate, and modernize the SFMTA's aging facilities to facilitate improvement of the overall transportation service delivery system in San Francisco, begins with the Project. Potrero Yard was built in 1915 and is situated on 4.4 acres bounded by Bryant, 17th, Hampshire and Mariposa Streets (Project Site). It is the first site scheduled under the Program that the SFMTA will modernize and improve due to the age of the current facility, and because of rapidly changing innovations in bus fleet technology which makes it obsolete. The existing two-story building originally operated as a streetcar facility housing 100 streetcars. It has since been expanded to house and maintain approximately 138 40-foot and 60-foot trolley buses, although it remains functionally obsolete.

The Project will replace the existing two-story building and bus yard with a facility (Facility) that includes a modern, three-story, efficiently designed bus maintenance and storage facility, equipped to serve the SFMTA's growing fleet as it transitions to battery electric vehicles (Bus Yard Component). The SFMTA would use the Bus Yard Component to store and perform routine maintenance on trolley buses and future zero-emission electric busses, serve as a new consolidated site for Muni Operator Training and Muni Street Operations, and provide open, naturally lit, and well-ventilated working conditions for employees. It will ensure resiliency to climate change and natural disasters and improve transit service by reducing vehicle breakdowns, increasing on-time performance, and reducing passenger overcrowding. The new Bus Yard Component will increase the maintenance and storage capacity of at the Project Site by approximately 50 percent. When completed, the Bus Yard Component will become a beacon of the SFMTA's commitment to workspace improvements for its employees.

A key component of the Building Progress Program is to maximize the use of SFMTA properties through a joint development model. Joint development allows the SFMTA to support major City policy initiatives and provide the SFMTA opportunities for sustainable revenue generation for transit and other transportation services. Consistent with the City's Public Land for Housing initiative, the SFMTA is pursuing housing as a complementary joint development at the Project site if proven feasible. Successful coordination is a key component to delivering such a complex project and program successfully. As part of the Building Progress Program, a multi-departmental Memorandum of Understanding (MOU) was signed in May of 2020, creating a complete citywide team led by the SFMTA in partnership with the San Francisco Planning Department, the Mayor's Office of Housing and Community Development, the Office of Economic and Workforce Development and Department of Public Works. Based on internal analyses and an extensive public outreach program, those City departments and the SFMTA have determined that housing may be a feasible and compatible use at the Project Site and proposes that multi-family housing with commercial space be a principal component of the Project (Housing Component). The SFMTA's preliminary Project analysis includes a Housing Component with up to 575 residential units (50% of which would be affordable) on the Project Site.

The SFMTA is incurring various predevelopment costs to facilitate the Housing Component, such as staff time, City Attorney's Office time, Planning Department time, and outside consultant and outside

counsel time and studies. If the Housing Component successfully receives all funding needed to commence construction of the entire Housing Component, which is to be funded with non-SFMTA funds, the SFMTA will be reimbursed for those costs. If the Housing Component does not receive all the needed funding, the SFMTA will not be reimbursed for all those costs.

The SFMTA's expenditures in connection with the Housing Component are consistent with the City's Transit First Policy because the Housing Component would be integrated with the Bus Yard Component (a transit facility), would have no private parking for residents, and would therefore encourage future residents to use public transit, bicycles, and walking as alternatives to travel by private automobile. If successful, this type of joint development could serve as a model for future transportation investments that generate demand for public transit within the City and further the SFMTA's Charter mandate to manage the City's transportation system to help the City meet its goals for quality of life, environmental sustainability, and economic growth.

Joint Development Delivery Method

Due to the Project's multiple components and objectives, the SFMTA brought legislation to the SFMTA Board of Directors (SFMTA Board) and Board of Supervisors to utilize a joint development procurement method for the Project. On April 7, 2020, the SFMTA Board of Directors approved Resolution 200407-035, authorizing the use of a joint development procurement method for the Project and authorizing the Director of Transportation to seek approval from the Board of Supervisors for a Project-specific ordinance to implement that procurement method for the Project. On March 16, 2021, the Board of Supervisors adopted Ordinance 38-21 to approve a joint development delivery method and a best-value selection of the developer for the Project and exempt various Project agreements from certain San Francisco Administrative Code requirements that are inconsistent with the joint development delivery method. Ordinance No. 38-21 was signed by the Mayor and became effective on April 25, 2021.

Using this joint development delivery method, the Lead Developer will have the full responsibility and financial liability for performing Project predevelopment work during the term of the PDA (PDA Term). During the PDA Term, the Lead Developer and the SFMTA will negotiate the terms of the agreements for the delivery of the Project (Project Agreements). The Project Agreements would cover the final design and construction of the Facility, the operation of the Housing Component, and the maintenance of the infrastructure shared by the Bus Facility Component and the Housing Component (Common Infrastructure), and any other Facility infrastructure identified by the SFMTA (Additional Infrastructure).

The Project Agreements would be long-term contractual arrangements, with the Lead Developer responsible for managing contractors (e.g., design-build contractors and maintenance contactors), successfully delivering the Project, maintaining the Common Infrastructure and the Additional Infrastructure (Infrastructure Facility Maintenance), and coordinating the delivery of the Housing Component. There would be subcontracts for the construction and operation of the Housing Component for financing purposes, but the Lead Developer will be required to ensure that the SFMTA bear no risk arising from multiple parties delivering the Project. The SFMTA would continue to own the Project Site

and the Bus Yard Component, while the Lead Developer would have the right to deliver, operate and own the Housing Component during the term of the applicable agreement (e.g., an air rights lease). The Lead Developer would be responsible for ensuring the adequate integration and joint operation of the Bus Yard Component and Housing Component and the quality and durability of construction methods and equipment design related to the Facility's building structure and major building systems.

Project Procurement Process

A Request for Qualifications (RFQ) was issued on August 21, 2020; three teams were short-listed and invited to participate in a Request for Proposals for the Project (RFP), which was released on April 9, 2021 (RFP). The three short-listed teams were Potrero Mission Community Partners (led by John Laing Group and Edgemoor Infrastructure & Real Estate), Potrero Neighborhood Collective (led by Plenary), Potrero Yard Community Partners (led by Fengate Asset Management, Emerald Fund, and American Triple I Partners). During the initial nine-month RFP process, the three teams worked on their technical conceptual drawings and met regularly with the SFMTA in a series of one-on-one meetings. Each meeting session was divided into technical and a commercial-financial segments. During the technical meetings, the three teams discussed their land use plan and design approach for the Bus Yard Component, among other topics. In the commercial-financial meetings, the three teams and the SFMTA discussed the terms of the PDA and the teams' approaches for financing and structuring the Project. Through these three-way discussions, the SFMTA aimed to leverage the competitive tension of the procurement to ensure that the City's interests were preserved in the form of the PDA.

The RFP proposals were due December 30, 2021, and all three short-listed teams submitted timely proposals. After completing the RFP evaluation of the submitted proposals, the SFMTA determined that the following two short-listed teams (Qualified Proposers) were responsive to the RFP requirements and passed all administrative pass-fail requirements: Potrero Mission Community Partners (led by John Laing Group and Edgemoor Infrastructure & Real Estate) and Potrero Neighborhood Collective (PNC), led by Plenary Americas US Holdings Inc. (Plenary). However, the SFMTA determined it was in the best interest of the Project and the City to exercise the SFMTA's authority under the RFP to request proposal revisions (Proposal Revisions) from the Qualified Proposers. The proposal revision process allowed the SFMTA to have further discussions with the Qualified Proposers so they could better align their proposals with the SFMTA's stated Project goals and offer the best value to the SFMTA and City with respect to the Project.

On May 26, 2022, the SFMTA issued an RFP addendum for Proposal Revisions from the Qualified Proposers. On July 26, 2022, a single Proposal Revision was received. After extensive evaluation of the submitted Proposal Revision through the RFP process, PNC was selected as the preferred proposer.

The RFP addendum for Proposal Revisions included the form of the PDA, which was modified from the version approved by the SFMTA Board of Directors through Resolution 220301-017 on March 1, 2022. Those modifications included adjustments in the Project structure and a $350,000 increase in the continuation payment. After PNC was selected as the preferred proposer, the form of the PDA was

completed to include Project details and commitments in PNC's RFP proposal (Selected Proposal) to create the final version of the PDA (Final PDA), which is included as Enclosure 2. As permitted under the RFP, PNC formed the Lead Developer to enter into and perform under the Final PDA. The Lead Developer has executed the Final PDA, and the SFMTA seeks authorization to execute the Final PDA soon as possible to meet the November 30, 2027, deadline for substantial completion of the Bus Yard Component and the Common Infrastructure.

Predevelopment Agreement

The PDA will govern the Project's predevelopment phase, with the Lead Developer performing predevelopment activities that must occur for construction to begin in the fall of 2024. The Lead Developer would fund its predevelopment activities during the PDA Term. It is customary industry practice to have a predevelopment agreement for this type of joint development delivery method. The list below summarizes some of the major PDA provisions that may be of particular interest.

1. Predevelopment Approach

During the PDA Term, the City and Lead Developer will work collaboratively to develop the Project so construction of the Facility can begin by the fall of 2024. The PDA governs the Lead Developer's development of schematic designs, financing plans, Infrastructure Facility Maintenance plans, the pursuit of Project entitlements, and the procurement of contractors to design and build the Bus Yard Component and Common Infrastructure and perform the Infrastructure Facility Maintenance. It also governs the parties' negotiations to develop the terms of the Project Agreements. The SFMTA will not bear any integration risk between the physical and operational components of the Facility. Unless otherwise agreed to by the SFMTA, the Project must conform to certain technical requirements included in the Final PDA and the Selected Proposal.

2. Fixed Budget Limit

The Project budget is capped by a limit of $391,567,596 (Fixed Budget Limit), which was the amount given in the Selected Proposal. The Fixed Budget Limit is the maximum anticipated sum of (i) the design and construction costs for the Bus Yard Component, (ii) the SFMTA's pro rata share of the design and construction costs for the Common Infrastructure, (iii) the SFMTA's pro rata share of the Infrastructure Facility Maintenance costs, and (iv) the SFMTA's pro rata share of the Lead Developer's predevelopment costs. The PDA sets forth the circumstances in which the Fixed Budget Limit can be adjusted, including for SFMTA changes to the Project (including changes to its technical requirements), unknown conditions, and certain changes to applicable law.

The PDA also includes guidelines for the budget allowances included in the Selected Proposal for escalation, insurance costs, and certain items requiring further design or development, emerging technology, or iterative designs. These budget allowances and their pricing will be refined during the PDA Term. The updated cost of construction escalation and the insurance will be permitted modifications to the Fixed Budget Limit. If City elects to include the other allowance items in the Project, the Fixed Budget Limit will be increased to reflect their additional cost. Adherence to the Fixed

Budget Limit is expected throughout the PDA Term, with incentives and requirements to that effect.

3. Term and Performance Milestones

Unless terminated earlier, the PDA Term will expire 568 days after its commencement or the earlier execution of the Project Agreements. Appendix B-1 to the PDA lists three PDA phases of work, with certain performance milestones (Performance Milestones) and dates for completing those Performance Milestones. If those predevelopment activities are successfully and timely completed, construction of the Bus Yard Component would commence in the fall of 2024 and be substantially completed by November 30, 2027. Each PDA phase can only proceed after City issues, in its sole discretion, a Notice to Proceed (NTP) for that phase. If City issues NTP 1 for Phase 1, it will occur after the PDA is signed and Lead Developer satisfies certain administrative requirements. If City issues NTP 2 for Phase 2, it will occur after City approves the 50% schematic design drawings and Project plans submitted by Lead Developer. If City issues NTP 3, it will occur after City approves the 100% schematic design drawings, design-build contractor procurement short-listing, and form of design-build contractor and facility maintenance contractor requests for proposals submitted by Lead Developer.

In addition, Appendix B-1 outlines a floating Performance Milestone for Phase 2 (Phase 2 Floating Milestone). The Phase 2 Floating Milestone occurs if there is final certification of the environmental impact report for the Project under CEQA and final adoption of the special use district, conditional use authorization, General Plan Referral, and related General Plan amendments needed for the Project. If the Phase 2 Floating Milestone occurs, Lead Developer's PDA obligations will suspend unless the SFMTA elects, in its sole discretion, to issue a notice for the Lead Developer to continue the PDA work (Continuation Notice). Issuing the Continuation Notice would require the SFMTA to pay the Lead Developer $4,350,000 (Continuation Payment) in recognition of achieving this important milestone. The SFMTA Board originally approved the form of PDA with a $4,000,000 Continuation Payment, but the SFMTA agreed to increase it to $4,350,000 during the RFP's process for Proposal Revisions.

Achieving the Phase 2 Floating Milestone increases the value of the Project Site, as the SFMTA would have key entitlements for the Bus Yard Component and the Housing Component, which are critical to the timely completion of the Project. The Lead Developer will also incur substantial predevelopment costs by the Phase 2 Floating Milestone, some of which would be borne by the SFMTA if it had to perform the Lead Developer's work in achieving the Phase 2 Floating Milestone. The SFMTA obtained an appraisal for the future Housing Component on September 24, 2021, which includes the value of the Housing Component if (i) the Project has received all entitlements and (ii) there are no lawsuits challenging those entitlements or any such lawsuits have been finally resolved in the City's favor. After reviewing the appraisal and analyzing the stage of entitlements and potential for lawsuits at the Phase 2 Floating Milestone, SFMTA staff have determined that the amount of the Continuation Payment is commercially reasonable.

Under Section 9.118 of the San Francisco Charter, the SFMTA cannot make the Continuation Payment without the prior approval from the Board of Supervisors, so it will not issue the Continuation Notice without first obtaining that approval from the Board of Supervisors. If the SFMTA issues the Continuation Notice, the Lead Developer's PDA obligations would resume under the same terms and

structure. If the SFMTA does not elect to issue the Continuation Notice and the Lead Developer does not agree to remove the SFMTA's obligation to make the Continuation Payment, the PDA would terminate and the SFMTA would make the termination payment described below.

4. Site Due Diligence and Design Development

The PDA requires that Lead Developer conduct its own due diligence investigations of the Project site to assess its physical, geological, and environmental conditions, subject to an access agreement between the Lead Developer and the SFMTA. The form of the access agreement is Appendix L to the PDA.

The PDA also requires Lead Developer to commence schematic design and engineering of the Project once it completes its Project site due diligence. As required in PDA Appendix B-1, the Lead Developer must complete 100% schematic design drawings during the PDA Term. PDA Appendix B-2 sets forth the requirements for all design deliverables to be produced by the Lead Developer during the PDA Term.

5. Asset Management Program and Infrastructure Facility Maintenance

The Project would include the joint development partner performing the Infrastructure Facility Maintenance after the Bus Yard Component is substantially completed. During the PDA Term, the Lead Developer must submit to the SFMTA its Asset Management Program and finalize the scope of work and performance requirements for the Infrastructure Facility Maintenance and the Housing Component property management. The Asset Management Program must be completed before the Lead Developer procures the Project's design-build contractor and Infrastructure Facility Maintenance contractor. It will define the interface among (i) the SFMTA's operations and maintenance activities within the Bus Yard Component, (ii) Infrastructure Facility Maintenance, and (iii) the Housing Component property management.

6. Housing Component, Feasibility, Financing, and Changes

The RFP outlined the SFMTA's requirements for the Housing Component, with no less than 50% of the residential units to be affordable (no more than 120% area median income (AMI), as published by the Mayor's Office of Housing and Community Development). The Housing Component proposed in the Selected Proposal (Proposed Housing) would have 575 affordable housing units (divided among one senior low-income housing project; two family low-income housing projects, and one workforce housing project) including space for community-based organizations and/or small businesses. Two hundred and ninety-one (291) of the housing units would be for households that make no more than 80% AMI, with the remainder of the two hundred and eighty-four (284) units for households that make no more than 120% AMI, all of which will be contingent on the Lead Developer obtaining the necessary financing and entitlements. The Lead Developer will be responsible for pursuing the financing and entitlements, verifying the feasibility of the Proposed Housing, and performing all other predevelopment activities for the Proposed Housing. These activities will be pursued under a Housing Component development plan submitted by the Lead Developer for the SFMTA's review early in the PDA Term. The PDA includes a process for Proposed Housing changes by the SFMTA or the Lead Developer, eligible reasons for considering those changes, and assigning the risk of design cost increases needed for

the Bus Yard Component and Common Infrastructure due to those changes. The SFMTA is incurring various predevelopment costs to facilitate the Housing Component, such as staff time, City Attorney's Office time, Planning Department time, and outside consultant and outside counsel time and studies.

7. Contractor Procurement and Final Price

During Phase 2 of the PDA, the Lead Developer must issue a request for qualification for the Bus Yard Component and Common Infrastructure design-build and Infrastructure Facility Maintenance contracts. During PDA Phase 3, the Lead Developer must issue a request for proposals for those contracts and present the pricing of the submitted bids to the SFMTA once received. This pricing will then be compared to the anticipated costs of those contracts given in the Fixed Budget Limit (as adjusted under the PDA, e.g., for insurance and escalation). If the pricing for those contracts is lower than as anticipated in the Fixed Budget Limit, then the SFMTA will receive 70% of the value of that reduced pricing. If the contract pricing is higher than as anticipated in the Fixed Budget Limit, the Lead Developer and the SFMTA will negotiate in good faith on how to bring the contract pricing down to the amounts anticipated in the Fixed Budget Limit. If those negotiations are not successful, the SFMTA can elect to terminate the PDA, accept the higher contract price, or reprocure the contracts. If accepted by the SFMTA, the Bus Yard Component and Common Infrastructure design-build and Infrastructure Facility Maintenance contract pricing will be used to calculate the SFMTA's final price for the Infrastructure Facility Maintenance and the design and construction of the Bus Yard Component and its share of the Common Infrastructure.

8. Project Agreements and Approvals

As stated above, the parties will negotiate the terms of the Project Agreements and other agreements needed for the delivery of the Project during the PDA Term. The applicable Project Agreements must include the terms of a preliminary term sheet, the form of which was included in the Project RFP and submitted with the Selected Proposal (Preliminary Term Sheet), and the terms of a Housing Component term sheet developed during the PDA Term. Given the cost and length of the Project Agreements, they must be approved by both the SFMTA Board and Board of Supervisors. The SFMTA will seek approval of the Project Agreements from the SFMTA Board at the end of the PDA Term if the negotiations and other predevelopment activities are successfully completed.

9. Termination Provisions and City's Right to Work Product

Consistent with typical City contract provisions, the SFMTA maintains the right to terminate the PDA for convenience at any time. If the PDA terminates for any reason other than a Lead Developer default or the parties' execution of a Project Agreements, the SFMTA must make the termination payment described in the PDA. The termination payment amount increases in each PDA Phase and is subject to the Lead Developer's qualified costs for performing the PDA work required for that PDA Phase. At no time will the termination payment exceed $9,990,000.

If there is any termination of the PDA, the Lead Developer must deliver all the materials it prepared under the PDA to the SFMTA and assign the right to use those materials to the SFMTA. Any

termination payment made to the Lead Developer under the PDA will be less than the value of the work materials the Lead Developer delivers to the SFMTA under the PDA.

10. Guaranty and Default

Plenary will provide a third-party guaranty for the performance of Lead Developer's PDA obligations. That guaranty must remain in effect, or replaced with another guaranty approved by the SFMTA, throughout the PDA Term. The PDA describes various events of default by the parties. Lead Developer defaults include a failure to timely achieve any of the Performance Milestones or perform its other PDA obligations (subject to applicable cure procedures), changes to the Lead Developer's team without prior City consent, material misrepresentations, willful misconduct, fraud, and failure to comply or perform under associated agreements. SFMTA defaults include failure to timely perform its PDA obligations (subject to applicable cure procedures), insolvency, or material misrepresentations.

STAKEHOLDER ENGAGEMENT

Since the launch of the Building Progress Program in 2017, the SFMTA has led an extensive community outreach effort for the Project. Major outreach activities have included numerous community events and open houses, tours of Potrero Yard, regular meetings of the Potrero Yard Working Group, and grassroots outreach to individual residents and community organizations.

Five major public events were held 2018-2021, including the SFMTA hosting a major community workshop in the summer of 2020 that allowed the community to weigh in on the values and principles to be memorialized in the RFQ and RFP to communicate to potential joint development partners the SFMTA's expectations for the Project and to align those expectations, to the extent feasible, with the community's expectations for the Project.

The SFMTA received extensive feedback from the community on numerous aspects of the Project, and this feedback was reflected in the project application submitted to the Planning Department in November 2019 to initiate environmental review, to develop the RFQ and RFP, including the development of local business enterprises (LBE) goals. Outreach activities focused on the conceptual design of the Project (e.g., the size of the bus facility, number, and affordability of the housing units). A virtual meeting in July of 2021 provided feedback to developer questions. Outreach tabling events were at the Potrero Hill Festival on October 15, 2022, and at Sunday Streets/Phoenix Day on October 17, 2021, and on July 10, and October 16, 2022. More than ten public facility tours have been conducted at the Project Site since December 8, 2021, and they will continue throughout the fall 2022. The tours have been well received and successful.

Paralleling the community outreach effort has been a continued, extensive in-reach effort. The SFMTA continues to coordinate closely with elected officials and partner City agencies (Planning, Public Works, Office of Economic and Workforce Development, Mayor's Office of Housing and Community Development) as the Project shifts towards PDA implementation. The SFMTA will continue dialog with staff at Potrero Yard and with labor to answer questions about the project and solicit feedback to inform

the PDA process. During the week of Aug. 15, 2022, Project staff provided updates on the project for frontline staff at the yard, including maintenance, operations, and administrative employees. Team members met staff at early morning meetings and throughout the day over the course of the week to answer questions about the Project and show renderings for both the Muni Metro East Bus Yard and 1399 Marin Street facilities. These two sites will become relocation facilities when Potrero Yards is taken offline for construction starting in 2024.

In addition, the Project has been presented in a variety of public hearing settings to date, where formal public comment has been received and documented. This includes a February 29, 2021, meeting of the San Francisco County Transportation Authority (SFCTA) to allocate $5,773,403 in funding for the Project, and an informational hearing at the Planning Commission on May 13, 2021, in addition to the other public hearings described elsewhere in this Calendar Item.

ALTERNATIVES CONSIDERED

An alternative to the PDA is the SFMTA going directly to the Project Agreements. That would require the SFMTA to develop the Project to the level needed to issue an RFQ and RFP for the Project Agreements at its own cost and without input from the developer team that would deliver the Project. That input is key in addressing design, schedule, financing, and funding issues such as, but not limited to, the cost-efficient design of the Bus Yard Component, the market and financial feasibility of the Housing Component (including the number and type of housing units), and the functional integration of the Housing Component with the Bus Yard Component. Without the Lead Developer team's input on these critical aspects, an RFQ and RFP for the Project might not generate sufficient bids from qualified development teams. It could also increase the SFMTA's costs for the Project.

FUNDING IMPACT

The PDA includes two provisions that would result in direct payments to the Lead Developer:

1. Termination Payment: If the PDA terminates for any reason other than a Lead Developer default or execution of a Project Agreements, the SFMTA must make a termination payment to the Lead Developer. The termination payment amount is determined by the PDA Phase in which the PDA terminates and the Lead Developer's costs to provide the deliverables required for that PDA Phase, but in no event will the amount exceed $9,990,000.
2. Continuation Payment: If the Phase 2 Floating Milestone occurs and the SFMTA elects, in its sole discretion, to issue the Continuation Notice, the SFMTA must make the Continuation Payment ($4,350,000). The SFMTA cannot make the Continuation Payment without the prior approval of the Board of Supervisors under City Charter Section 9.118. Accordingly, the SFMTA will not issue a Continuation Notice without first receiving that approval for the Continuation Payment. SFMTA staff will notify the SFMTA Board if they request approval for the Continuation Payment from the Board of Supervisors.

In addition to the potential for direct payments to the Lead Developer, the SFMTA will also be incurring significant internal costs for staff, Planning and City Attorney's Office time and outside counsel's and

consultants' costs to advance the Project during the PDA Term. Current project activities (including any termination or continuation payments that may be payable to the Lead Developer) are currently funded through a mix of transportation sales taxes and SFMTA revenues appropriated by the SFMTA Board of Directors for facility capital projects. The funding for this overall project takes a "pay-go" approach, in which only immediate project phases are funded with the limited resources available for facility capital projects, while concurrent advocacy for additional capital funds occurs for future phases.

ENVIRONMENTAL REVIEW

Environmental review for implementation of the Project is underway. On June 30, 2021, the Project's Draft Environmental Impact Report (DEIR) was published by the Planning Department. The DEIR was reviewed by the Historic Preservation Commission on August 4, 2021, and by the Planning Commission on August 26, 2021. The DEIR public comment period closed on August 31, 2021. The SFMTA anticipates bringing the Environmental Impact Report to the Planning Commission for approval in 2023 for certification, after integrating details from the Selected Proposal.

On October 6, 2022, the SFMTA, under authority delegated by the Planning Department, determined that the Potrero Yard Modernization Project Predevelopment Agreement is not a "project" under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b).

A copy of the CEQA determination is on file with the Secretary to the SFMTA Board of Directors and is incorporated herein by reference.

OTHER APPROVALS RECEIVED OR STILL REQUIRED

The City Attorney's Office has reviewed this calendar item.

RECOMMENDATION

Staff recommends authorizing the Director of Transportation to execute a Predevelopment Agreement (PDA) with Potrero Neighborhood Collective, LLC (Lead Developer) for the Potrero Yard Modernization Project, with a term that will not exceed 568 days, a potential termination payment that will not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,350,000.

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. _____

WHEREAS, The Potrero Yard Modernization Project (Project) includes the simultaneous development and construction of a facility (Facility) with a modern bus storage and maintenance component (Bus Yard Component) and, if feasible, a multi-family housing and commercial component (Housing Component); and,

WHEREAS, The San Francisco Municipal Transportation Agency (SFMTA) will deliver the Bus Yard Component under its Building Progress Program and, if feasible, pursue the Housing Component consistent with the citywide Public Land for Housing initiative, which encourages joint development opportunities for housing on public sites; and,

WHEREAS, Based on the Project's public and private features, staff have determined it is appropriate and in the City's best interest to deliver the Project utilizing a joint development procurement method; and,

WHEREAS, The joint development solution provides for a single point-of-responsibility for managing project complexity and contractors (e.g., design-build contractors, maintenance contactors for private housing development), financing, and successfully delivering the Project; and,

WHEREAS, The SFMTA and San Francisco Public Works (SFPW) partnered to procure a developer to design, build, and finance the Facility, operate the Housing Component, and maintain certain Facility infrastructure elements; and,

WHEREAS, In November 2019, the SFMTA submitted a project application for the Project to the San Francisco Planning Department (Planning Department) to initiate environmental review of the Project under the California Environmental Quality Act (CEQA); and,

WHEREAS, A Request for Qualifications for the Project was issued on August 21, 2020, and three of the responding teams (Potrero Mission Community Partners, Potrero Neighborhood Collective, and Potrero Yard Community Partners) were short-listed; and,

WHEREAS, On April 7, 2020, the SFMTA Board approved Resolution 200407-035, authorizing the SFMTA to use a joint development procurement method to deliver the Project and seek approval from the Board of Supervisors (BOS) for that method; and,

WHEREAS, On March 16, 2021, the BOS adopted Ordinance 38-21 to approve a joint development delivery method and a best-value selection of the developer for the Project and exempted various Project agreements from certain San Francisco Administrative Code requirements that are inconsistent with the joint development delivery method, with the ordinance being signed by the Mayor and effective on April 25, 2021; and,

WHEREAS, A Request for Proposals for the Project (RFP) was released to the three short-listed teams on April 9, 2021 (RFP), with proposals due December 30, 2021, and all three short-listed teams submitting timely proposals; and,

WHEREAS, The Project's Draft Environmental Impact Report (DEIR) was published by the Planning Department on June 30, 2021, reviewed by the Historic Preservation Commission on August 4, 2021, and reviewed by the Planning Commission on August 26, 2021, and the public comment period closed on August 31, 2021, and the SFMTA anticipates bringing the Environmental Impact Report to the Planning Commission for approval in 2023, after including updated Project details, responding to all comments received to the DEIR, and otherwise complying with all relevant CEQA Guidelines; and,

WHEREAS, On March 1, 2022, the SFMTA Board adopted Resolution 220301-017 to approve the form of Predevelopment Agreement (Form PDA) for the Project, with a term that will not exceed 568 days, a potential termination payment that will not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,000,000; and,

WHEREAS, In March of 2022, the SFMTA completed its evaluation of the submitted RFP proposals and determined that two proposers (Qualified Proposers) submitted responsive proposals that passed all administrative pass-fail criteria, and those Qualified Proposers were Potrero Mission Community Partners, led by John Laing Group and Edgemoor Infrastructure & Real Estate, and Potrero Neighborhood Collective (PNC), led by Plenary Americas US Holdings Inc. (Plenary); and,

WHEREAS, On May 26, 2022, the SFMTA exercised its RFP right to request proposal revisions ("Proposal Revisions") from the Qualified Proposers so they could better align their proposals with the SFMTA's stated Project goals and offer the best value to the SFMTA and City with respect to the Project; and,

WHEREAS, The Form PDA was modified in the request for Proposal Revisions to increase a continuation payment from $4,000,000 to $4,350,000; and,

WHEREAS, The SFMTA received a timely Proposal Revision from PNC on July 20, 2022, and based on evaluation of the submitted Proposal Revision, the SFMTA selected PNC as the preferred proposer to enter into the PDA on September 12, 2022, and after selecting PNC as the preferred proposer, the SFMTA further modified the Form PDA to include details and commitments from PNC's RFP proposal (Final PDA) and PNC submitted the required post-selection deliverables; and,

WHEREAS, On October 17, 2022, the SFMTA issued a notification of intent to award the Final PDA and issued a public announcement naming the PNC as the preferred proposer and as permitted in the RFP, PNC created Potrero Neighborhood Collective, LLC (Lead Developer), which has Plenary as its sole member, to be the developer under the Final PDA; and,

WHEREAS, The SFMTA is requesting the SFMTA Board of Directors to authorize the Director of Transportation to execute the Final PDA with the Lead Developer; and,

WHEREAS, The Final PDA sets the terms for the parties' negotiation of the future agreements for the delivery of the Project and outlines the Project predevelopment activities to be performed by the Lead Developer; and,

WHEREAS, The SFMTA can terminate the PDA at any time for convenience, and if the PDA terminates for any reason other than the Lead Developer's default or the parties' execution of the agreements for the delivery of the Project, the PDA includes a termination payment to the Lead Developer in the amount described in the form of PDA presented to the SFMTA Board, which shall not exceed $9,990,000; and,

WHEREAS, If there is final certification of the environmental impact report for the Project under CEQA and final adoption of the special use district, conditional use authorization, General Plan Referral, and related General Plan amendments needed for the Project, the Lead Developer's PDA obligations will suspend unless the SFMTA elects, in its sole discretion, to issue a notice for the Lead Developer to continue the PDA work (Continuation Notice); and,

WHEREAS, If the SFMTA issues the Continuation Notice, it must pay the Lead Developer a continuation payment of $4,350,000 (Continuation Payment) and the SFMTA cannot make the Continuation Payment without the prior approval from the Board of Supervisors under Section 9.118 of the San Francisco Charter, so the SFMTA will not issue the Continuation Notice without first obtaining the prior approval for the Continuation Payment from the Board of Supervisors; and,

WHEREAS, The PDA should be executed as soon as possible to meet the November 30, 2027, deadline for substantial completion of the Bus Yard Component and the infrastructure it shares with the Housing Component; and,

WHEREAS, On October 6, 2022, the SFMTA, under authority delegated by the Planning Department, determined that the Potrero Yard Modernization Project Predevelopment Agreement is not a "project" under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b); and,

WHEREAS, A copy of the CEQA determination is on file with the Secretary to the SFMTA Board of Directors and is incorporated herein by reference; now, therefore, be it

RESOLVED, That the SFMTA Board of Directors authorizes the Director of Transportation to execute a Predevelopment Agreement with Potrero Neighborhood Collective, LLC for the Potrero Yard Modernization Project, with a term that will not exceed 568 days, a potential termination payment that will not exceed $9,990,000, and if approved by the Board of Supervisors, a potential continuation payment of $4,350,000.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 1, 2022.

_____

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

SFMTA

Building Progress: Potrero Yard Neighborhood Working Group

March 2023 (Meeting #30)

POTRERO Neighborhood Collective

Agenda

1. Welcome — 5 minutes
2. Member & SFMTA Announcements — 5 minutes
3. Schedule Update – 5 minutes
4. Project Update – 90 minutes
5. Next Steps — 10 minutes
6. Public comment - *members of the public who wish to participate in the meeting virtually will be placed on mute, regardless of joining via video or by phone, until the Public Comment section.*

POTRERO Neighborhood Collective

Today's Objectives

- Discuss feedback received from PYNWG and the public
- Provide updates related to most recent design updates
- Answer Questions

Announcements Working Group

Working Group

- Working Group members please share upcoming events or activities with the Working Group, SFMTA, and PNC.

SFMTA

- New pilot program of 1X California express bus between Richmond District and Financial District: SFMTA.com/1X

- Take Muni's Safety Survey: SFMTA.com/SafetySurvey about personal safety and gender-based harassment in the Muni system

POTRERO Neighborhood Collective

Schedule Updates:

As PNC progresses design and pursues Entitlements for the Project, upcoming submittals include:

- Project Application submit to City Planning (March 2023)
- 50% *draft* Schematic Design submit to SFMTA (March 8, 2023 – tomorrow!)
- 50% **final** Schematic Design submit to SFMTA (May 3, 2023)

POTRERO Neighborhood Collective

Schedule Updates:

As PNC progresses design and pursues Entitlements for the Project, upcoming community engagement activities include:

- **Staff In-Reach event (Tuesday, March 14, 2023)**
- **Community Open House (Saturday, March 18, 2023)**

Schedule Updates:

As PNC progresses design and pursues Entitlements for the Project, upcoming community engagement activities include:

- **Arts Commission Civic Design Review Meeting**

  Monday, March 20, 2023
  2 p.m.

Notice: Potrero Yard Modernization Project – San Francisco Arts Commission Civic Design Review Committee Meeting

The San Francisco Municipal Transportation Agency (SFMTA) and selected development team Potrero Neighborhood Collective are reimagining Potrero Yard (located at Bryant and 17th streets) as the nation's first joint development of a bus maintenance facility with integrated housing and retail. The proposed design is envisioned to look like a single integrated building that incorporates careful material selection, views into the bus yard, and the engagement of local artists to ensure the proposed design relates to the neighborhood character and engages the community.

The San Francisco Arts Commission has a responsibility to hold a Civic Design Review of all civic buildings to ensure that each project's design is appropriate to its context in the urban environment. The Arts Commission's Civic Design Review Committee will evaluate the Potrero Yard Modernization Project (Project) design, scale, and massing for accessibility, safety and aesthetic merit.

The Project 50% Schematic Design will be presented to the Civic Design Review Committee during an in-person public meeting on:

Monday, March 20, 2023 at 2 p.m.
401 Van Ness Avenue, Suite 125 (San Francisco)

Potrero Neighborhood Collective and SFMTA welcome public input on the Project and encourage attendance to the Civic Design Review Committee. For more information about the Civic Design Review Committee and process, please visit www.sfartscommision.org.

For more information about the Potrero Yard Modernization Project, please visit www.SFMTA.com/PotreroYard.

You Spoke, We Listened

Thank you for providing feedback on the conceptual design of the new Potrero Yard.

Your input helps create a more equitable and sustainable project that serves the City's unique dual need of transit and housing.

Since December 2022, we have questions on:

- Activation and streetscape on 17th Street – *7 minutes*
- Commercial – *10 minutes*
- Housing Plans – *20 minutes*
- Public Spaces, including landscaping – *5 minutes*
- Look and Feel, including building materials – *7 minutes*
- Transit Operations – *5 minutes*
- Transportation Modes and Needs – *25 minutes*
- Public Art – *10 minutes*

Streetscape at 17th Street: Input Received

- Suggest providing sunny seating areas, vegetation, human-scale art, and materials for general public use.
- Request public restroom at 17th Street and Bryant Street.
- Preference toward providing opportunities to activate 17th Street more than it is currently activated.
- Dislike for large walls.
- Request mid-block crossing and clarity on what happens to the existing bus yard entrance.

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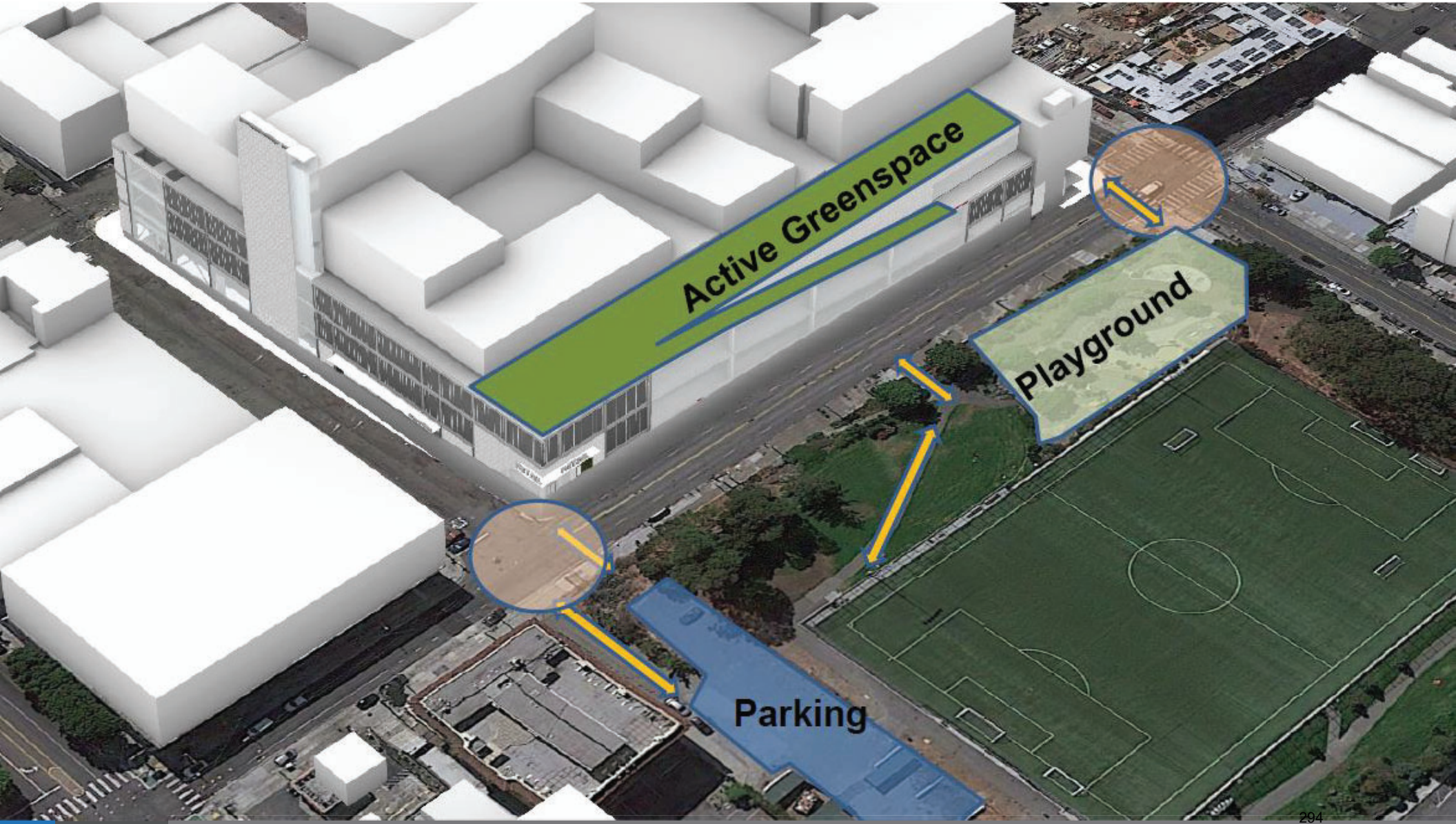
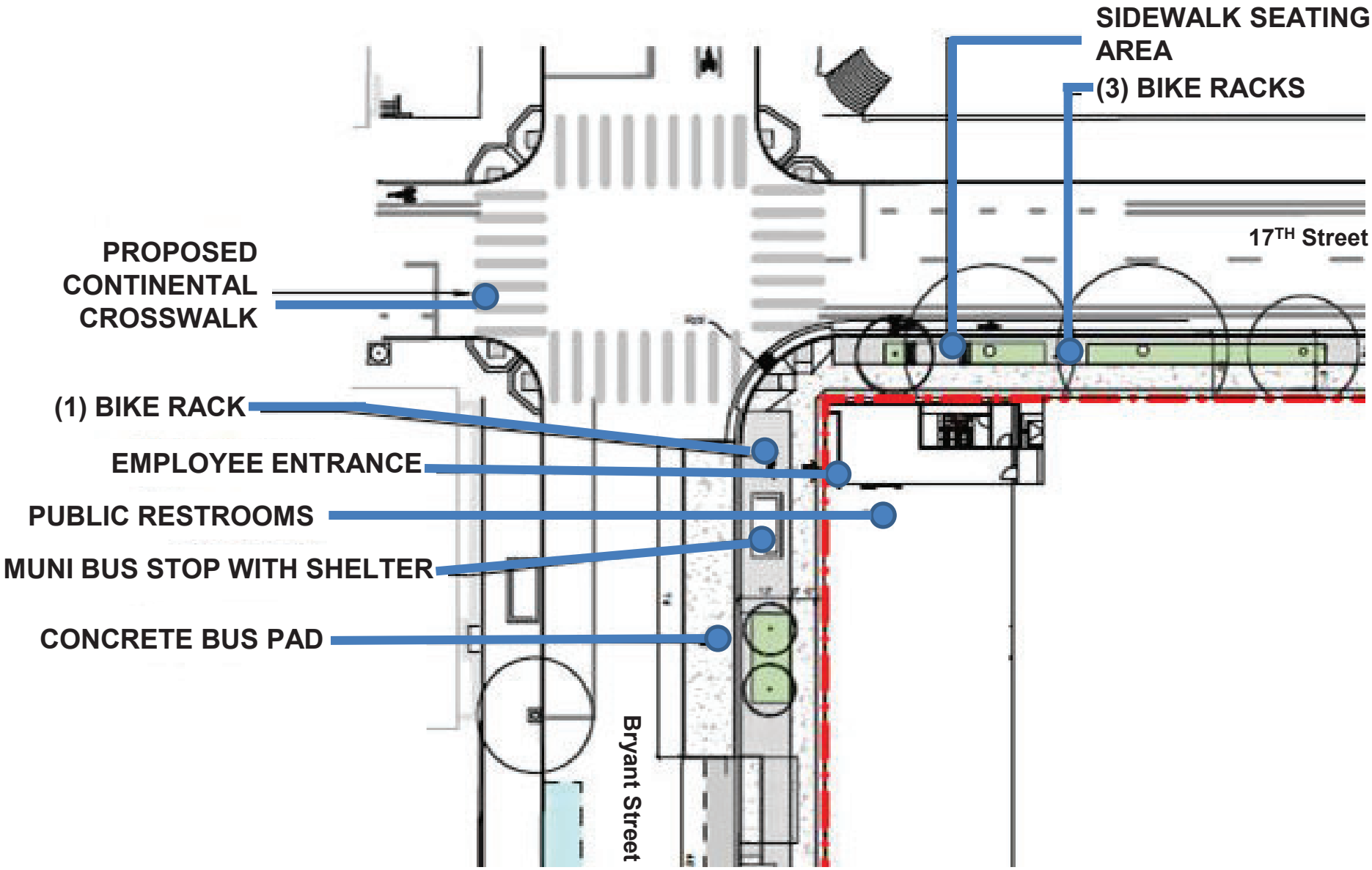
Streetscape on 17th Street: Park Integration



Streetscape on 17th Street: at Bryant Street

Q: Can a restroom be located on 17th Street near Bryant Street?

Streetscape on 17th Street: Street Frontage at Bryant Street



Streetscape on 17th Street: Mid-Block

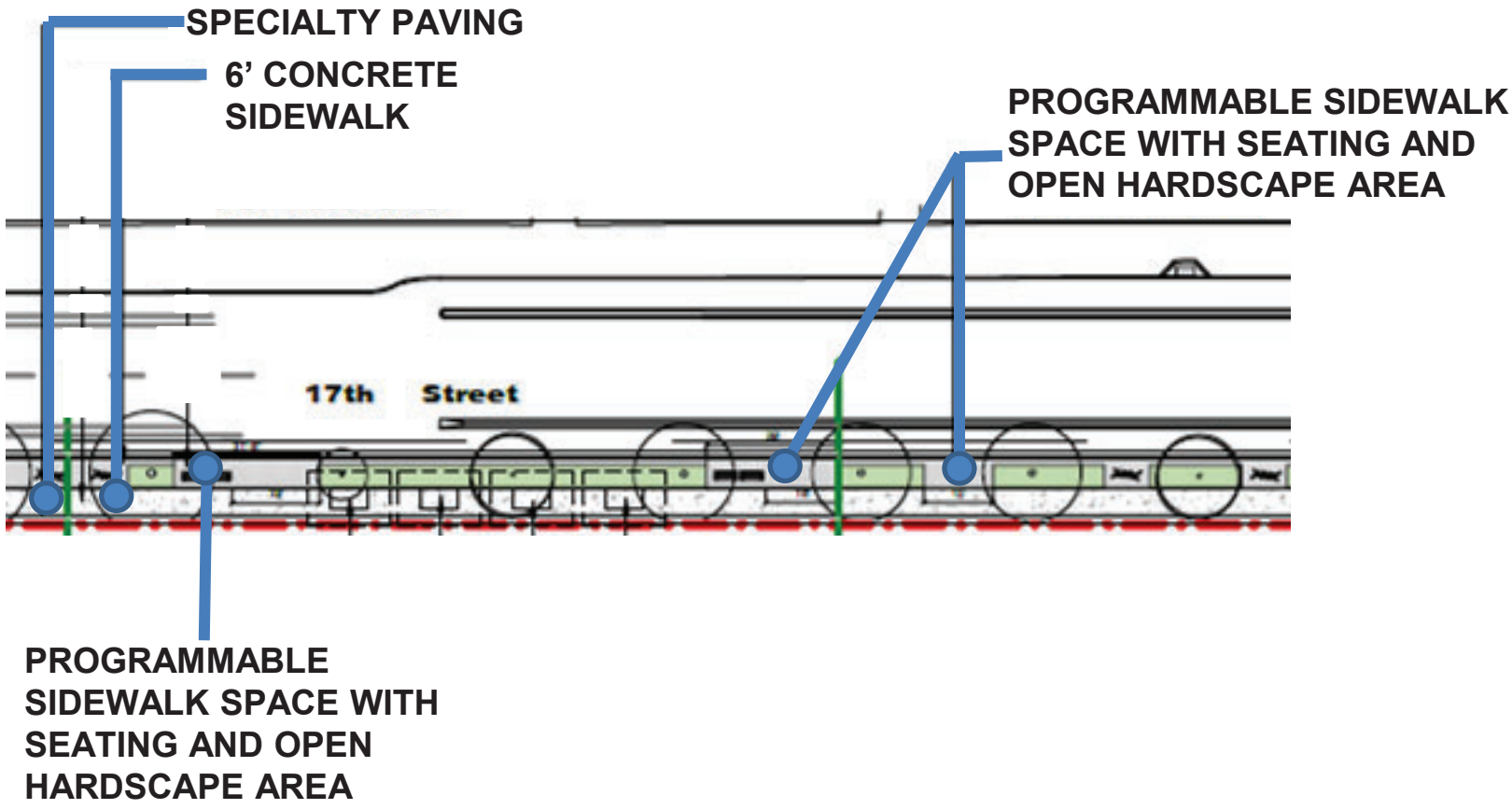
Q: What happens to the current bus entrances on 17th Street?

Q: Can there be a mid-block crossing from Franklin Square Park?

Q: Are the kiosks integrated into the building?

Streetscape on 17th Street: Mid-Block (night view)

Streetscape on 17th Street: Street Frontage at Mid-Block



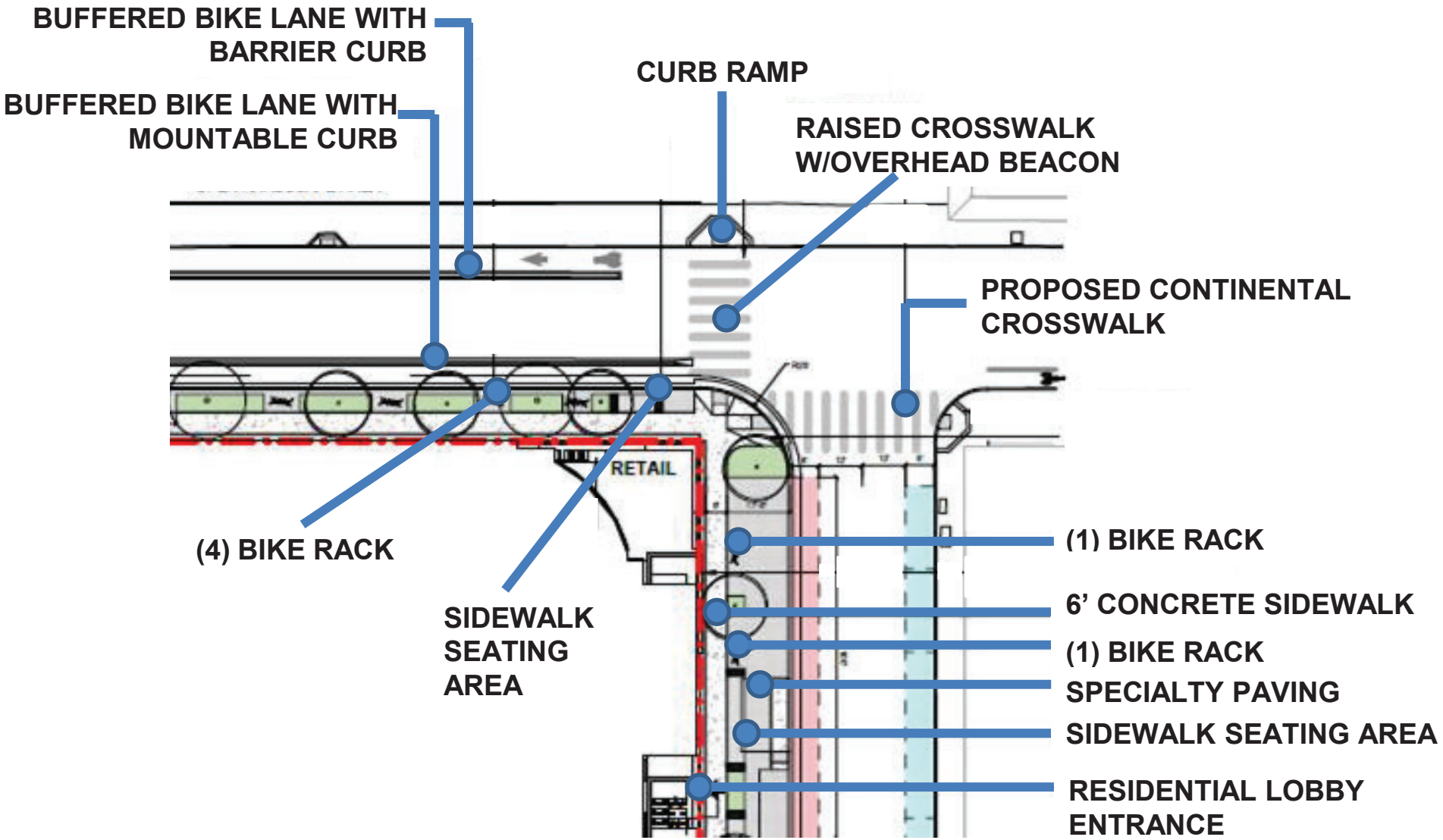
Streetscape on 17th Street: at Hampshire Street

Q: Will the restrooms be limited to café customers? How will the restrooms be maintained?

Streetscape on 17th Street: at Hampshire Street (night view)

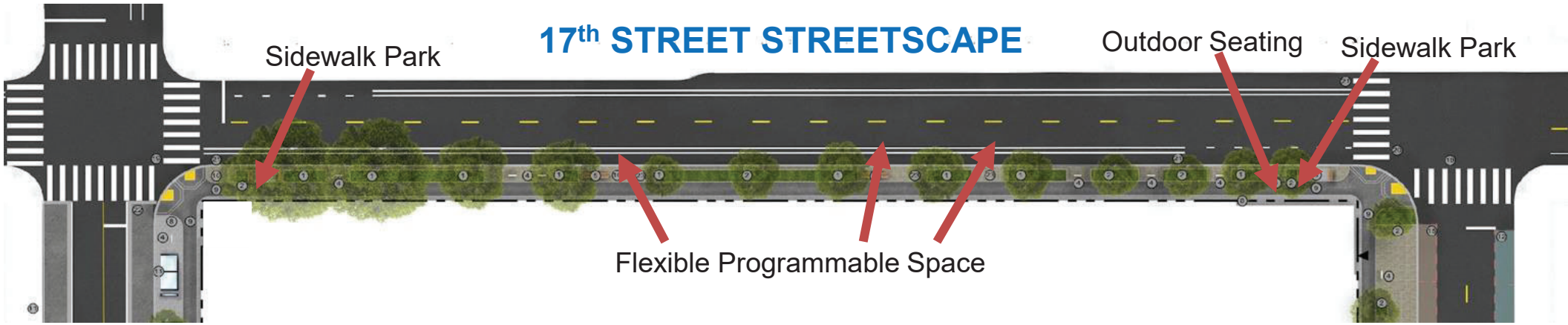
Q: Is there any other bus movement flow that would allow for more activation on 17th Street?

Streetscape on 17th Street: Street Frontage at Hampshire Street



Streetscape on 17th Street: Overall Street Frontage

- Façade materials, art and bus movement activate 17th Street façade.
- Flexible (multi-purpose) space in 3 locations along 17th Street. Kiosks, mobile food carts or other programmed activities may occur in these spaces.
- Employee Bus Yard entrance located at corner of Bryant & 17th streets and may include an art piece.
- Commercial spaces incorporated at both corners – Bryant and Hampshire streets.
- Space for café tables or other programmed activity between the sidewalk and building on 17th Street at Hampshire Street.
- New ground level plantings and existing trees create a linear “park style” streetscape.



Commercial & Retail: Input Received

Below list preferred Community Services and Retail options for the Commercial and Retail spaces:

Community Services

- Childcare (including Head Start)
- Art Studio Space
- Library
- Community Rooms
- Tech Hub
- Hub / Pop- Up Space

Retail

- Café (including a Latin American coffee shop)
- Bookstore
- La Cocina
- Bicycle Shop
- Local Clothing
- Nonprofit Business

POTRERO Neighborhood Collective

Commercial & Retail: Locations

Q: How many businesses are planned for the Project?

- Commercial spaces on 3 corners of Project site
- Corner spaces flexibly designed for café, retail, community-based arts, and/or cultural organizational uses
- Additional sidewalk spaces for Street Vendors along 17th Street

POTRERO Neighborhood Collective

Commercial & Retail: Concept

Q: Are the presence of existing businesses in the neighborhood considered?

The Commercial and Retail Concept includes:

- Prioritizing Mission-based organizations and small businesses on the ground floor of Bryant Street and 17th Street
- Dedicating 2-3 commercial spaces as permanently affordable
- Reserving spaces for street vendors located on 17th Street
- Selecting tenants that serve community needs

POTRERO Neighborhood Collective

Housing: Input Received

- Interest in increasing housing units and bedroom count.
- Concern about each building of housing being dedicated to different income ranges (4 buildings in total).
- Concern about transportation options provided to residents. Details of transportation related concerns listed under “Transportation Needs” section.

Housing: Concept and Considerations

The housing concept is an intergenerational livable community that maximizes the number of units and affordability.

Key considerations to meeting PNC housing concept include:

- **Schedule Constraints:** finalize design and secure financing of all housing units (500+ housing units in up to 4 separate component buildings) prior to starting bus yard operations.
- **Competitiveness:** State financing for affordable housing is highly competitive with limited funding to support a state-wide housing crisis.
- **Design Guidelines:** conform to the City's Design Guidelines that limit building height, massing, and building materials. The Design Guidelines were developed through early community input, including with feedback provided by the Potrero Yard Neighborhood Working Group.

POTRERO Neighborhood Collective

Housing: Unit Count and Mix

Q: Can the housing program have an increased number of multi-bedroom units?

Senior Housing
101 units (studio and 1 bedroom units)

Family Housing
193 units (studios, and mix of 1, 2, and 3 bedroom units)

Workforce Housing
218 units (studios and1, 2, and 3 bedroom units)

POTRERO Neighborhood Collective

Housing: Unit Count and Mix

Q: Can the housing program have an increased number of multi-bedroom units?

Initial Design (7/2022):
- **575 Units**
- **820 bedrooms**

50% Schematic Design (3/2023):
- **513 Units**
- **793 bedrooms**

While converting studios into larger family units we reduced the housing plan by **63 units and only 27 bedrooms.**

POTRERO Neighborhood Collective

Housing: Intergenerational Livable Community

Q: How can all four housing buildings be more integrated?

Shared Amenities include:

- Community Gardens
- Multi-Purpose Courtyard
- Outdoor Workout Area
- Gathering Spaces
- Tot Lot
- Multiple Community Rooms
- Two (2) Family Childcare Centers (FCC)

311

17th Street

Bryant Street

Hampshire Street

Mariposa Street

LEGEND

- Childcare
- Community Room
- Community Garden
- Pathways
- Laundry

Housing: Heights and Shadow

Q: Can we view drawings that show how tall the building is going to be?

Q: What will be the shadow impact of the housing on Franklin Square Park?

Q: Can building heights be increased to allow for additional housing?

Bryant Street

POTRERO Neighborhood Collective

Housing: Heights and Shadow

Q: Can we view drawings that show how tall the building is going to be?

Q: What will be the shadow impact of the housing on Franklin Square Park?

Q: Can building heights be increased to allow for additional housing?

Hampshire Street

POTRERO Neighborhood Collective

Public Spaces: Input Received

- Preference to include fruit trees and other edible vegetation in Project design.
- Request to keep as many of the existing trees as possible.
- In favor of wider sidewalks than existing sidewalks.
- Suggest providing enough space for tree roots and mounding for the trees planted on the podium so that the landscaping appears organic.
- Cypress trees impact bus operations and overhead lines.
- Request *not* to include Ficus, Fern Pine, and Water Gum trees because they tend to fall.
- Recommend referencing native habitat and geology (serpentine bedrock) of the Ohlone people (resource provided via email).
- Suggest providing sunny seating areas, vegetation, human-scale art, and materials for general public use.

POTRERO Neighborhood Collective

Public Spaces: Input Received (continued)

- Following preferences for trees:
  - Brisbane Box
  - Jacaranda
  - Golden Tree
  - California Buckeye
  - Coastal Live Oak
  - Gingkos
  - Native plants and trees
- Recommend referencing native habitat and geology (serpentine bedrock) of the Ohlone people.
- Preference to select trees that do not lose their leaves during the winter and don’t give off allergy-causing pollen.

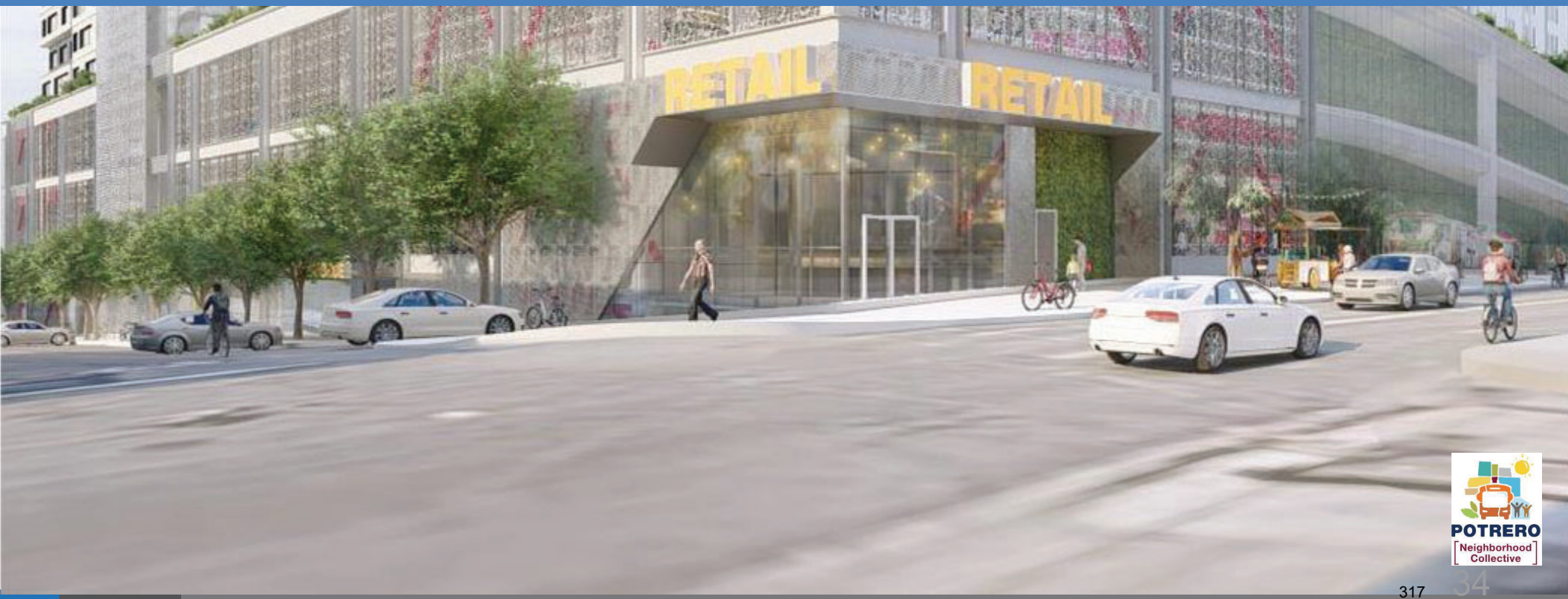
Public Spaces

Q: Is it possible for the Project to include fruit trees and other edible vegetation?

Q: Is it possible to keep any of the existing trees?

Q: Can the sidewalks be wider?

Q: Is there enough space for tree roots and mounding for the trees planted on the podium?



POTRERO Neighborhood Collective

Look and Feel: Input Received

- Preference toward raw materials (emphasis on metal, glass, lighting, brick, wood, and concrete) as aligned with Design Guidelines.

- Suggest muted colors for building materials with pop of colors in murals or other type of art.

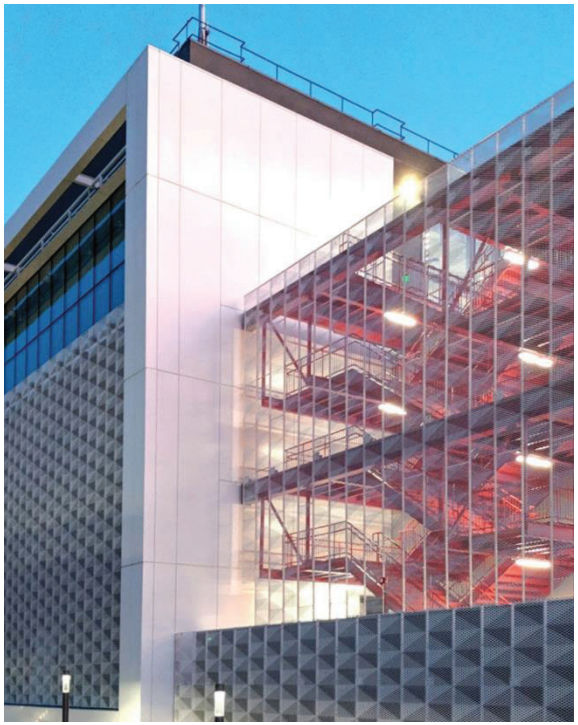
- Prefer not to use color variation or modulating facades as a technique to (falsely) give an appearance that the large facility is made of multiple smaller buildings.

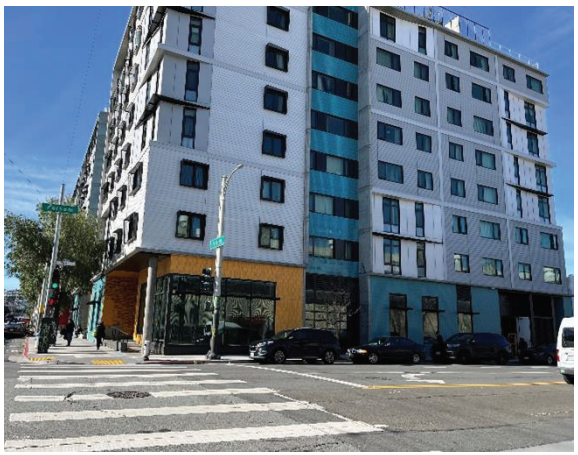
- Dislike for large walls.

- Balance texturized materials with permeable materials to create neighborhood integration and human scale.

POTRERO Neighborhood Collective

Look and Feel: Input Received





Look and Feel: Light and Metal

Look and Feel: Mix of Industrial Materials

Look and Feel: Muted Tones with Pop of Color

Transit Operations

Q: Will there be operational sound issues on Hampshire Street?

Q: Has an analysis been conducted on noise impacts of a 24-hour bus operations (for the community and new residents in housing next to and above Bus Yard)?

POTRERO Neighborhood Collective

Transit Operations

Q: How many employee parking spots are available at the Yard?

Q: What parking is available on the basement of the Bus Yard?

Q: Can SFMTA employee parking be added to the Project design?

Existing Facility

391 employees (245 operators)

138 buses

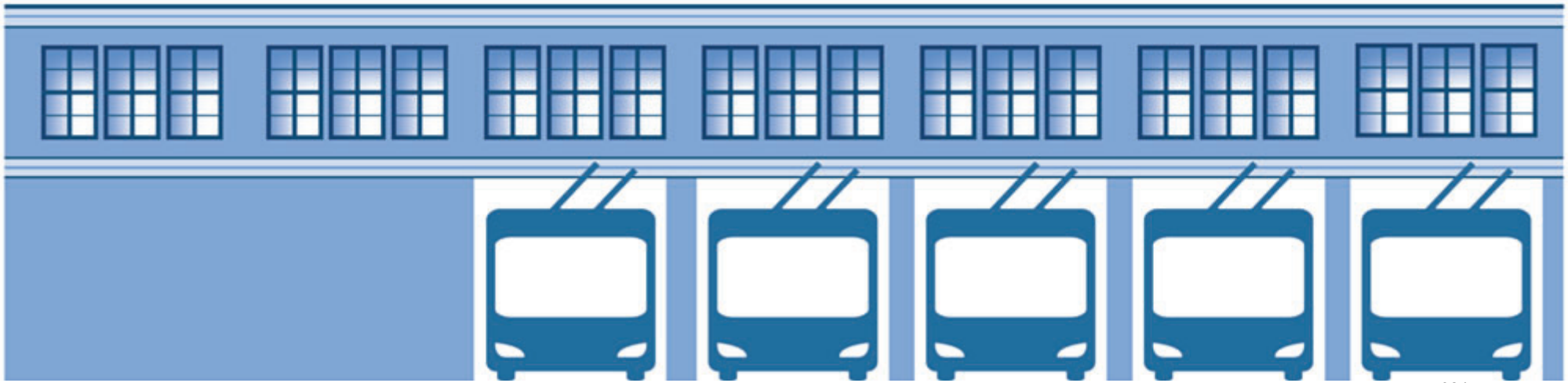
Future Facility

~100 Employees on site at a given time

829 employees (383 operators)

213 buses

157 non revenue & transit vehicle spaces (84 standard NRV spaces)



Transportation Needs of Residents and the Public: Input Received

- Preference for convenient bus stops for residents
- Request for protected bike lanes and protected intersections for greater safety between bicycles and buses
- Suggestion for bike parking and equipment for e-cargo bikes
- Mixed feedback that there is no residential parking on site, with some wanting residential parking and others wanting to maximize space for bus yard and housing

Transportation Needs of Residents and the Public: Transit-First City

Q: Can resident parking be added to the Project design?

A new Potrero Yard addresses critical transportation issues and is aligned with the longstanding Transit-First City policy that governs SFMTA. Priority features of the Potrero Yard Modernization Project include:

Efficiency

Repair buses faster, improving Muni's reliability

Sustainability

Provide the green infrastructure needed for all-electric fleet

Future Growth

Accommodate fleet as it grows -- room for 54% more buses at the yard

Work Conditions

Improve environments, amenities and safety conditions for 800+ staff

Transportation Needs of Residents and the Public: Transit and Active Transportation

Q: Can bike parking include space and equipment for e-cargo bikes?

Nearby transit routes

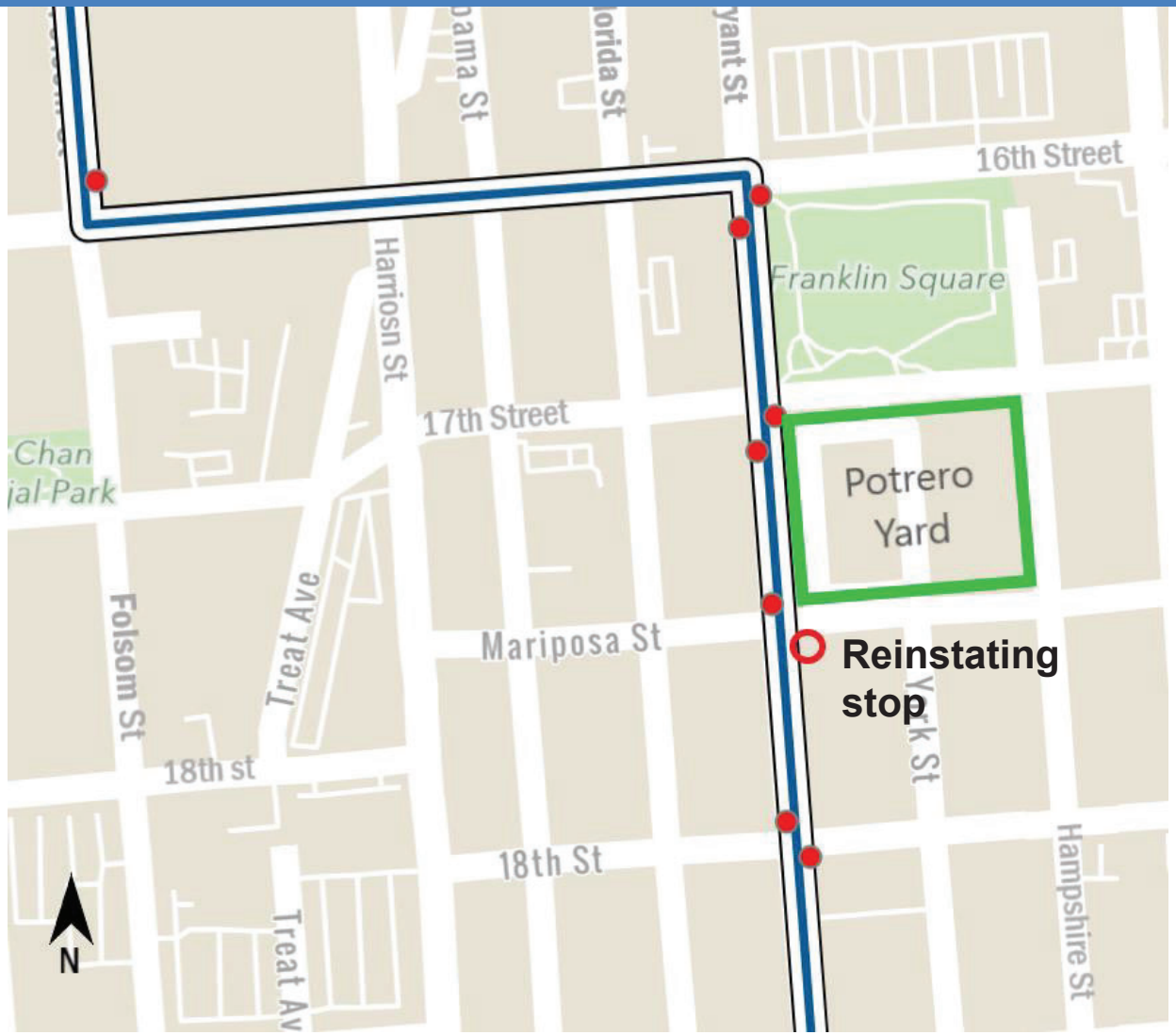
Nearby bike routes

In addition to supporting improved efficiencies of existing transit and expanding Muni fleet, the Project site is also conveniently located in a transit dense community.

- Close to busy transit corridors and neighborhood routes
  - 16th Street: 22 Fillmore, 33 Ashbury/18th St, 55 Dogpatch
  - Potrero Avenue: 9 San Bruno, 9R San Bruno Rapid
  - Bryant Street: 27 Bryant
  - Developing a Transit Pass Program for residents
- Improved pedestrian and bike infrastructure planned
  - Bulb outs to protect pedestrians and cyclists
  - Wider sidewalks where possible to create a safe and inviting place for people to walk
  - Bike parking provided for residents and staff
- Adjacent to bikeway network

Transportation Needs of Residents and the Public: 27 Bryant Line

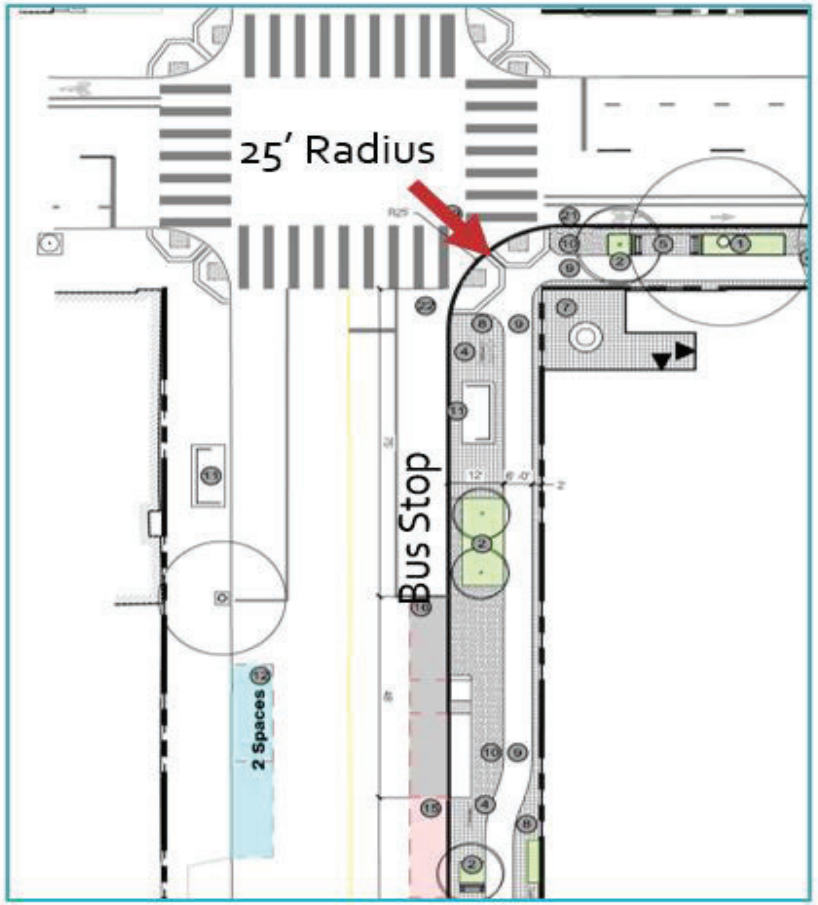
Q: Does the location of a bus stop determine whether there is a bus shelter?



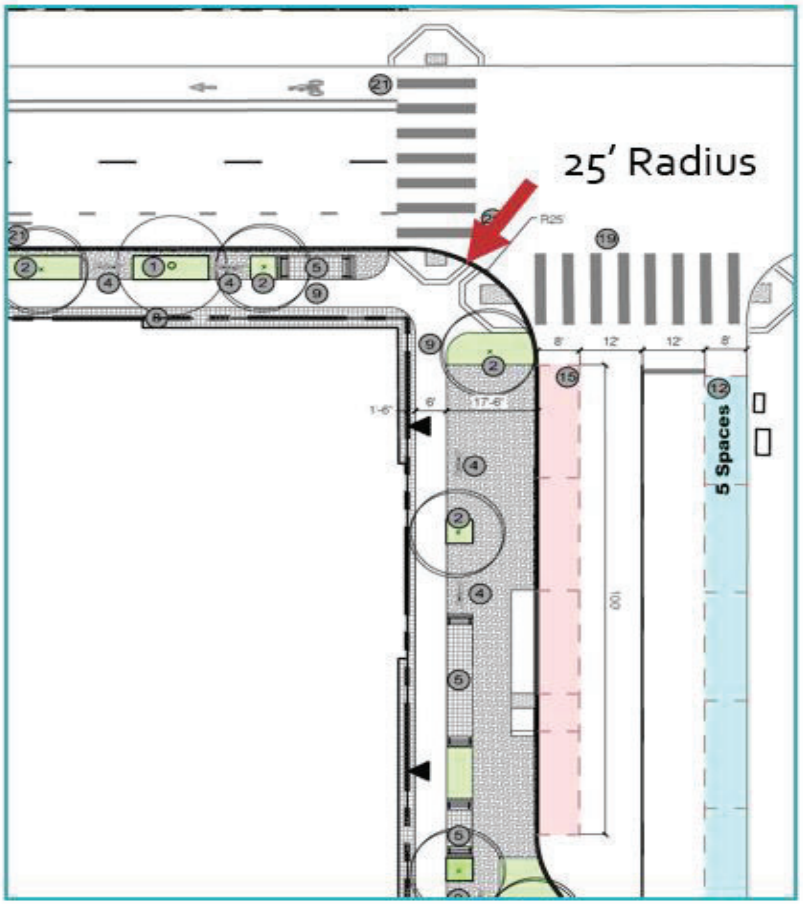
Transportation Needs of Residents and the Public: Pedestrian and Bike Safety

Q: What kind of protected intersections will be provided on 17th Street?

Q: What is your bike lane plan to ensure bikes do not collide with buses?



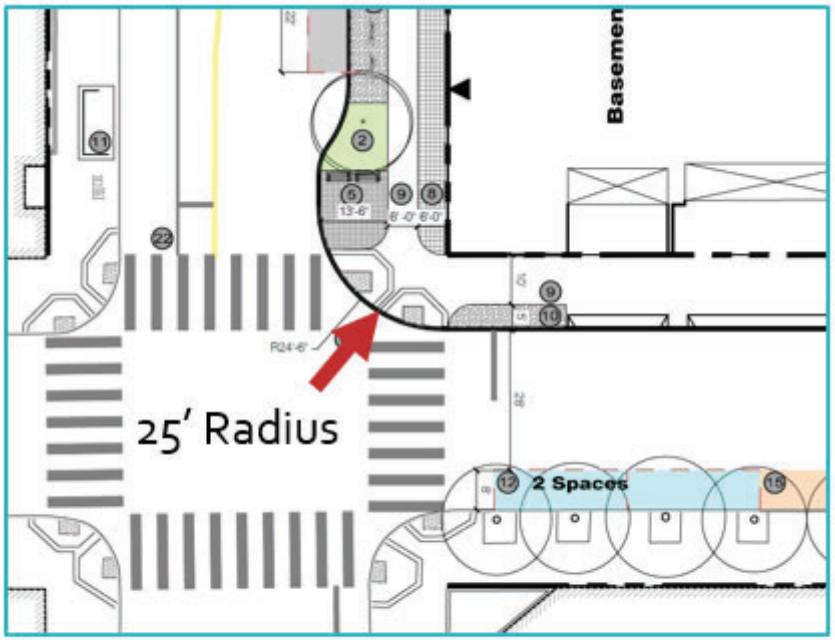
BRYANT & 17TH STREET
'BULB-OUT' | SIDEWALK WIDENING



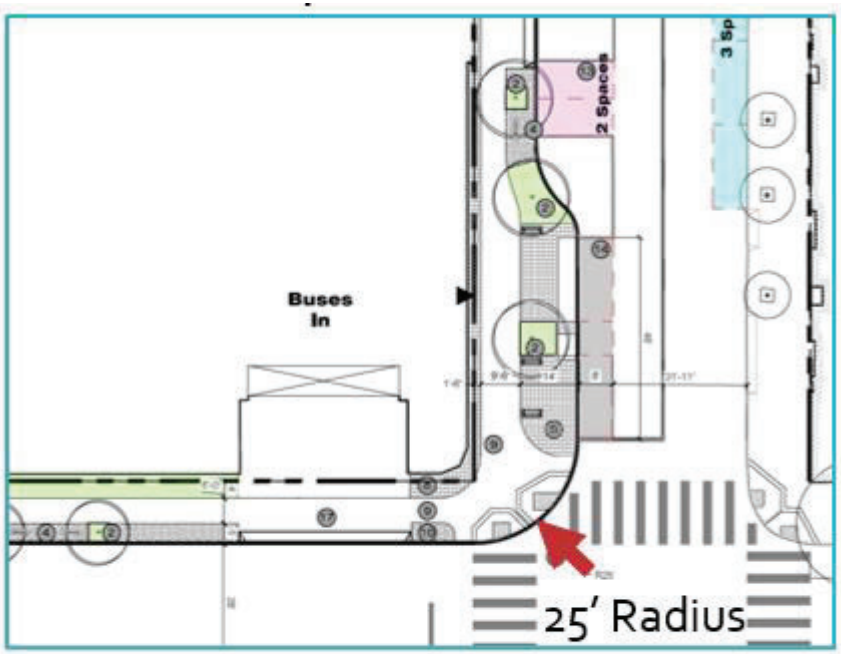
HAMPSHIRE & 17TH STREET
'BULB-OUT' | SIDEWALK WIDENING

- Concrete buffers with a mountable curb on the south side of 17th Street.
- Barrier curb on the north side of 17th Street where the street cross section allows.

Transportation Needs of Residents and the Public: Pedestrian and Bike Safety



BRYANT & MARIPOSA STREET BULB-OUT



HAMPSHIRE & MARIPOSA STREET BULB-OUT

- The corner treatments consider turning templates. Widened sidewalks are used where typical bulb-outs are not appropriate.
- Bulb out at Bryant and Mariposa has an increased radius and reduced pedestrian space based on turn templates. Still sufficient area to provide upgraded streetscaping
- Bulb-out curb returns meet SF Public Works Standards.

Transportation Needs of Residents and the Public: Personal Vehicle

Q: How many residential parking spots are available at the Project?

Q: Will residents of the building be allowed to apply for a resident parking permit?

NE Mission Parking Management Project Public Hearing scheduled March 21, 2023 (virtual, details pending)

For more information visit: https://www.sfmta.com/projects/northeast-mission-parking-management-project

- Car-share service planned with parking in Bus Yard basement
- Pick-up and Drop-off zones for ride hailing services near lobby entrances
- SFMTA operated public parking lots available
- NE Mission Parking Management Project to improve parking and curb access

Transportation Needs of SFMTA Staff

Q: Is the SFMTA considering adding bus routes for SFMTA employees who need public transit to get to work?

Q: Has SFMTA considered hiring drivers that reside in San Francisco [so their commute to work can be more feasible without parking]?

- Supporting SFMTA employees getting to work is important, including addressing challenges faced by staff who start or end Muni service.
- The agency is looking at ways to reduce the use of parking so that those employees who must drive, can continue to be able to do so.

Some solutions under consideration include:

- Carpool support
- Parking Management
- Partner with Ride-Hail Companies
- Regional Transit Subsidies
- Financial Incentives for Non-Drivers
- Alternate Work Schedule
- Improved Walk and Bike Access


SFMTA Facilities TDM Program

FINAL DRAFT

Prepared for:

SFMTA
One South Van Ness Avenue
San Francisco, CA 94103

Contract No: SFMTA-2019-14

Prepared by:

chs Consulting Group

TDM funding still to be identified.

Public Art: Input Received

Preferred themes for public art include:

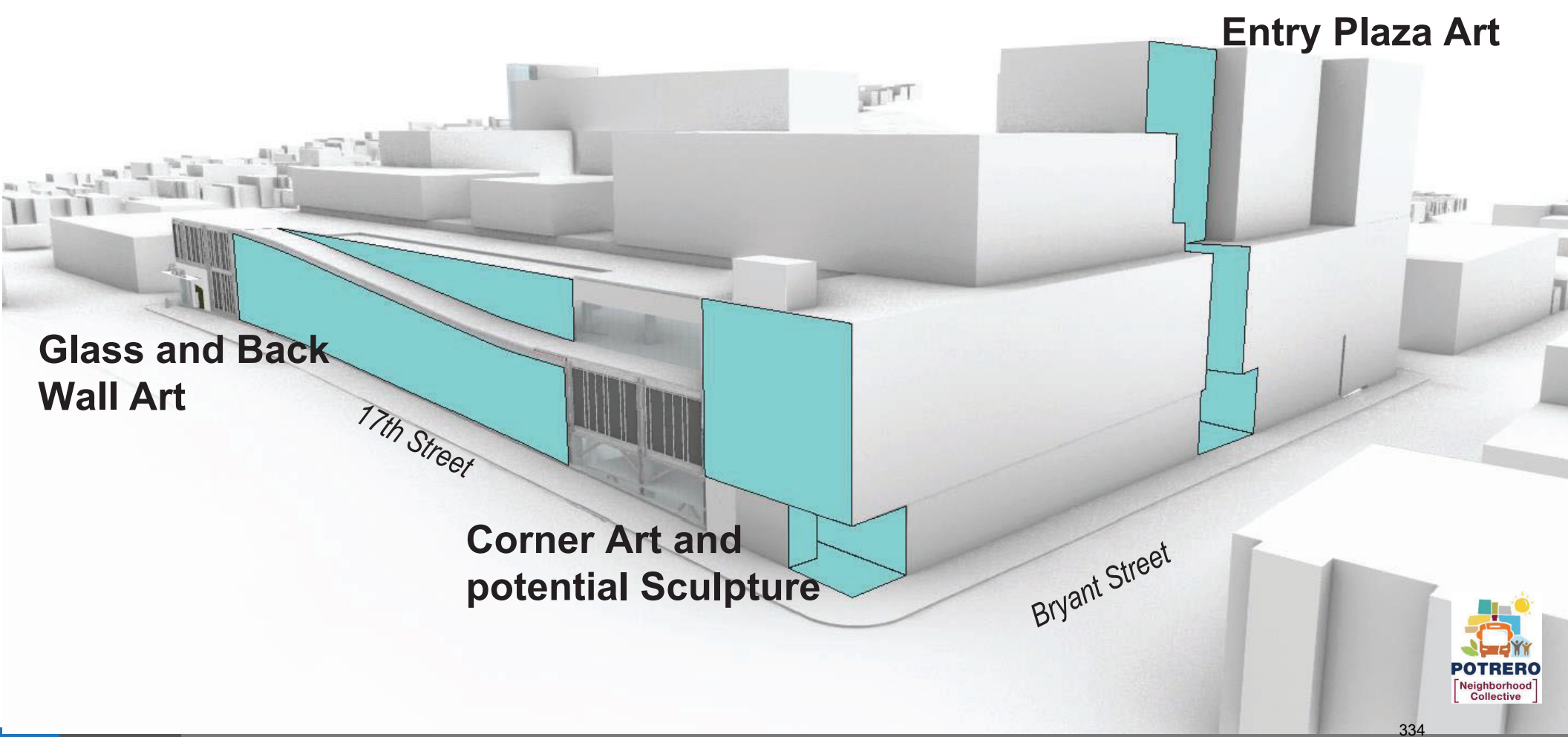
- Co-creation with local youth
- Consideration of size and scale of artwork
- Highlighting site history (celebrate bus and surrounding neighborhood)
- Hiring neighborhood artists
- Indigenous and Latino/a/e (such as Aztec, Huichol, Mayan, Ohlone)
- Interactive art (such as fountains, playgrounds)
- Lighting (LED lighting in particular, reference to Salesforce)

Public Art: Site Locations (17th and Bryant streets)

Q: What is the scale of the art?

Q: How many artists or art pieces will be included?

Q: Can art be child-centered?



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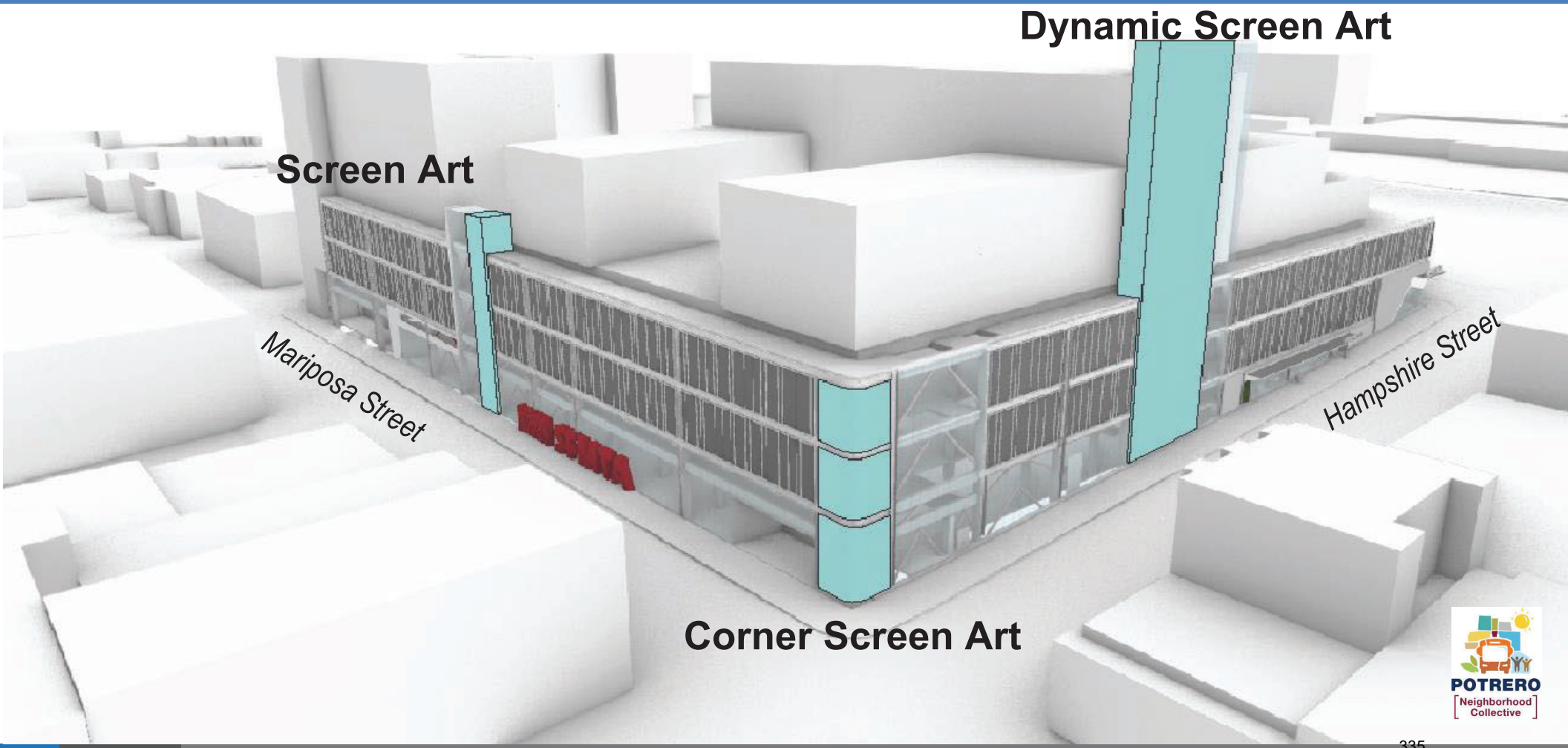
Public Art: Site Locations (Mariposa and Hampshire streets)

Q: Will you connect art to the area's past (example: Seals Stadium)?

Q: Can exhibit space for rotating art be featured?

Q: What is the definition of local artist?



POTRERO Neighborhood Collective

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Next Steps

A chance for Working Group members to weigh in on Open Decision Points:

- Next Working Group meeting: April 4, 2023
- Listening Sessions (schedules pending, dates TBD)
- **Community Open House: March 18, 2023 at 1 p.m. to 3 p.m.**
- **Arts Commission Civic Design Review Meeting: March 20, 2023 at 2 p.m.**

Public Comment

- Do any members of the public wish to comment?
- If you are joining via a computer please use the raise your hand feature and we will unmute you.
- Joining by phone? We will unmute folks one at a time and call out the last four digits of your phone number.

Please Reach Out Anytime

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Building Progress Public Affairs Manager
BonnieJean.vonKrogh@SFMTA.com
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Potrero Neighborhood Collective
PotreroYard@plenarygroup.com

POTRERO Neighborhood Collective

Building Progress: Potrero Yard Neighborhood Working Group

July 2023 | Meeting #34

BUILDING PROGRESS

Detailed Agenda

1. Welcome — 5 minutes
2. Member & SFMTA Announcements — 5 minutes
3. SFMTA Building Progress Update – 20 minutes
4. Project Updates: Contractor Procurement – 30 minutes
5. Project Updates: Local Business Enterprise – 30 minutes
6. Next Steps — 10 minutes
7. Public comment - members of the public who wish to participate in the meeting virtually will be placed on mute, regardless of joining via video or by phone, until the Public Comment section.

BUILDING PROGRESS

Today's Objectives

- Provide an update of the SFMTA Building Progress program
- Introduce the contractor procurement plan for the Bus Yard Infrastructure
- Present key points of draft Local Business Enterprise (LBE) Participation Plan

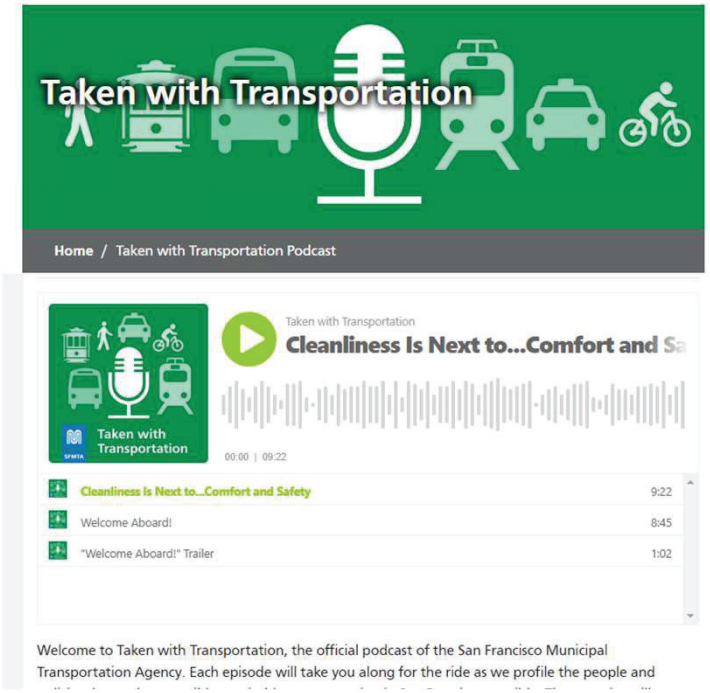
POTRERO Neighborhood Collective

Announcements: SFMTA

Celebrating 150 Years of Cable Cars

- $5 all-day pass for California line through 2023. (MuniMobile app)
- *Innovation to Icon: 150 Years of Cable Cars*. SFPL, 6th Floor, through Sep 30
- Special cars in service
- SFMTA.com/celebrating-150-years-cable-cars

New podcast: *Taken with Transportation*



- Hosted by Melissa Culross
- SFMTA.com/taken-transportation-podcast

BUILDING PROGRESS

Announcements: Working Group

Working Group members please share upcoming events or activities with the Working Group, SFMTA, and PNC.

Schedule Updates

As Project design progresses, in June PNC:

- Held 4 community listening sessions
- Held 4 meetings with LBEs and Micro-LBEs, including representatives of San Francisco Latino & Black Builders Association and the African American Construction Coalition
- Presented 50% Schematic Design and project progress to the SFMTA Board

To continue receiving public input on Potrero Yard, in July, PNC plans to:

- Meet with leadership from Renaissance Enterprise Center
- Presented to the Rowan Homeowners Association Board
- Meet with San Francisco Women Business Council members
- Participate in Sunday Streets (Valencia Street)

Upcoming submittals include:

- 100% draft Schematic Design submit to SFMTA (August 10, 2023)
- 100% final Schematic Design submit to SFMTA (October 5, 2023)
- Final Environmental Impact Report (FEIR) (TBD)

Community Listening Session:
Huntersview Hope SF (June 26, 2023)

Community Listening Sessions

Community organizations that PNC and the SFMTA have met with during the Predevelopment Agreement (PDA) phase (alphabetical order) include:

- Bicis del Pueblo
- Calle 24
- Dogpatch / Potrero Boosters Joint Livable Streets Committee
- Friends of Franklin Square
- Huntersview HOPE SF
- KQED
- Latino Taskforce (LTF)
- Mission Destino
- Potrero Boosters Design & Development Committee
- Rowan Homeowners Association
- San Francisco Latino & Black Builders Association
- San Francisco Latino Parity & Equity Coalition
- Various artists

Pending Community Meetings with:

- African American Cultural District
- American Indian Cultural District
- Bicis del Pueblo (Youth Group)
- Black to the Future
- Black Wall Street
- Hope SF Sites (various)
- Horizon
- Livable Cities
- Mission Cultural Center
- PODER (leadership)
- Senior Centers (various)
- Tenant Associations (various)

To maintain public engagement, PNC and the SFMTA will continue to participate in Community Listening Sessions. **Please share any organizations that the Working Group recommends that PNC and the SFMTA meet.**

Building Progress Program Update

Bonnie Jean von Krogh, SFMTA

BUILDING PROGRESS

Programmatic Update & Activities

Potrero Yard Neighborhood Working Group
July 11, 2023

Intro/Policy Goals

State of Good Repair

Modernize aging SFMTA facilities in order to meet the needs of everyone who travels in San Francisco.

Resiliency

Improve the transportation system's resiliency to seismic events, climate change, technology changes.

Community

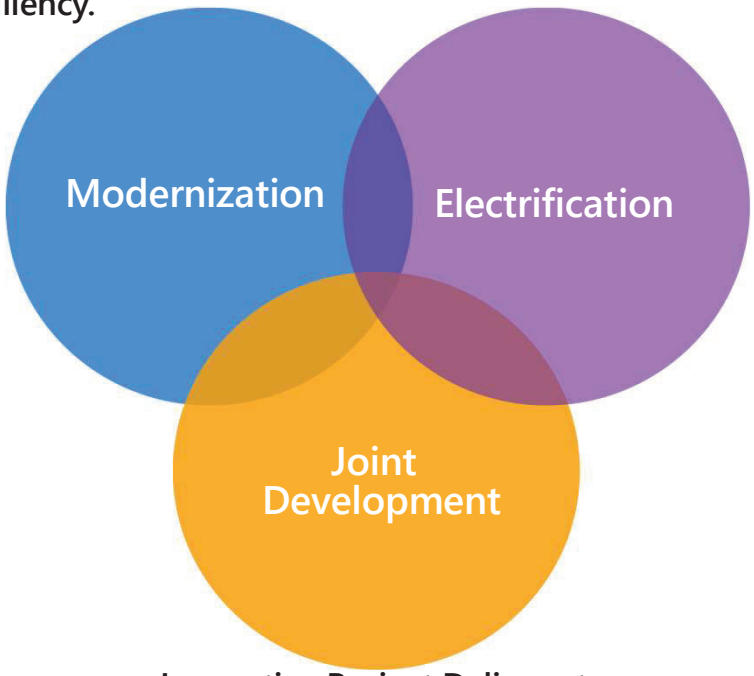
Make the SFMTA a better neighbor in the parts of the city that currently host our facilities.

Started in 2017, the **Building Progress Program is a $2+ billion planning and capital program** that continues to lead in innovative project delivery, adaptability, resilient planning and community outreach.

Core Program Areas

Modernization of Muni operational workspaces and maintenance equipment for growth and resiliency.

Transformation of Muni Yards to support both the trolley fleets and expansion to Battery Electric Buses (BEBs).



Innovative Project Delivery to finance Muni capital, maintenance and operations into the future.

Modernization Program
Potrero Yard Modernization
Presidio Yard Modernization

Electrification Program
Kirkland Yard Electrification - component
Wood Yard Pilot
Islais Creek Yard Pilot
Campus EV Chargers

Capital Program
1200 15th Street PCO HQ
Station Escalators/Elevators (i.e. Castro)
Operator Restrooms

Joint-Development Program
4th and Folsom
Parking Garages
Yard Modernization (Potrero + Presidio)

Cable Car Barn Program
Cable Car Barn Improvements
Cable Car Barn Master Plan

Facility Condition Assessment (FCA) Program
Implementation of $200+ million in deferred maintenance and repairs

State of Good Repair

Stations **12**	Buildings* **31**
Acres of Land **60**	Building Sq. Feet **1.9 M**
Building Value **$2.6 B**	Backlog Value **$0.9 B**
Stations Value **$2.6 B**	Backlog Value **$0.7 B**

Sources:
2021 SFMTA State of Good Repair Report
2017 SFMTA Facilities Framework
*Does not include inventory of 45 owned Operator Restrooms

Investment and rehabilitation in the SFMTA's campus of facilities across San Francisco takes on **one of the agency's biggest State of Good Repair challenges.**

POTRERO Neighborhood Collective

T2050

A once in a generation opportunity.

BUILDING PROGRESS

Fixing our buildings modernizes our maintenance capability and ***reduces building maintenance costs and energy use.***

San Francisco
TRANSPORTATION 2050

Our land is valuable and through joint-development ***could generate $30+ million a year for transportation.***

Our land throughout San Francisco provides a once in a generation opportunity to **generate significant revenue to fix our system and invest in transit service.**

Performance

Since 2017, **significant progress has been made** to plan for a resilient future, improve our existing facilities and open new and modern maintenance facilities and shops.

PCO HQ

1200 15th Street
- Transferred property from GSA
- Began design

$8.2 million Repairs
- **Restroom** Refresh Campaign
- **HVAC** Campaign
- **Breakroom** Campaign
- **Art** Program
- **Painting**
- **Lactation** Rooms

Potrero

Potrero Modernization
- Draft EIR Complete
- Special Legislation
- P3 RFQ/RFP
- PDA awarded to PNC

17 Escalators

Rebuilt at:
- Montgomery
- Powell
- Hallidie Plaza
- Civic Center
- Van Ness
- Church
- Castro

46 Operator Restrooms

New operator convenience facilities at various terminal locations

Woods
- **BEB Chargers** 12 installed (+12)
- **Bus wash**

What's Next?

In the coming months we will be advancing the following on the *critical path*:

- **New Bus Wash** at Woods Yard (anticipate complete in September) + plan for **Paint Booth Rehabilitation**
- **New Elevator** at Castro Station; construction contract awarded in January 2023.
- **Kirkland Yard Electrification** goes into Preliminary Engineering.
- **Review electrification program** schedule.
- **Decision on $8 million RASIE Grant** for Presidio Yard, preliminary engineering + environmental review and joint-development.
- **Begin work on Cable Car Barn** environmental review, after securing $2 million Federal Earmark.
- Release **Request for Proposals** for Station Condition Assessment.

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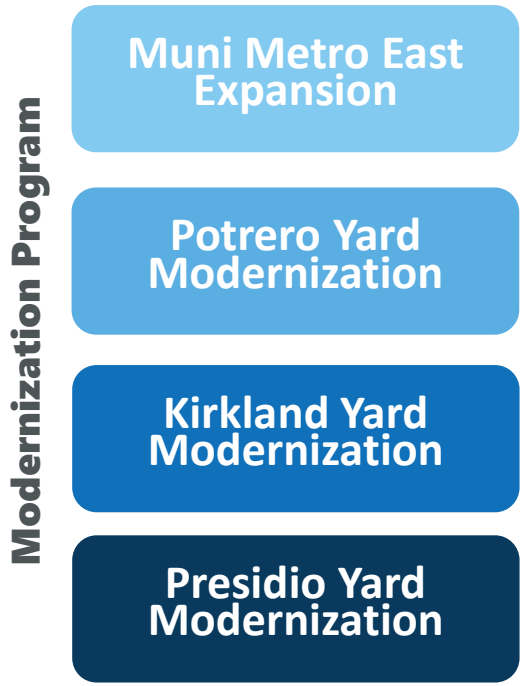


We have adjusted the Modernization Program based on the following:

- Muni Service
- Fleet requirements
- Regulatory requirements around electrification
- Funding availability + maximizing resources.

Modernization

The original 2017 Facilities Framework **designed the Building Progress Program to be adaptable** based on changing circumstances.

- Fleet Requirements
- Technology Changes
- Scope, Schedule and Budget Feasibility

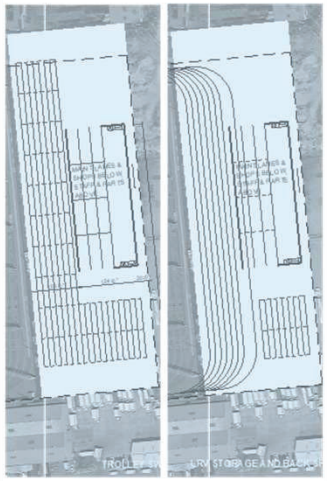
Modernization

ORIGINAL PROGRAM (2017)

The original program required a "swing" trolley facility at Muni Metro East on the expansion property and assumed that requirements for electric busses would immediately be met at Potrero and Presidio Yards.

Muni Metro East Expansion

Expand the site into the undeveloped 4 acres for a trolley coach facility



Potrero Yard

Rebuild as multi-level trolley and motor coach facility with private development above

Presidio Yard

Rebuild as multi-level trolley and Zero Emission Bus Facility with private development adjacent

Kirkland Yard

Rebuild as a multi-level facility with private development above

Modernization

UPDATED PROGRAM (2019)

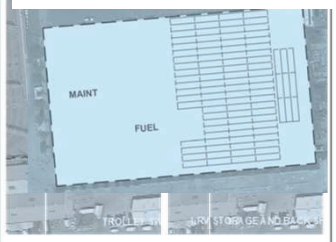
Based on stormwater requirements, fleet movements and requirements on site, the maintenance component of the trolley facility was going to be placed at the 1399 Marin Facility.

Muni Metro East Expansion

Expand the site into the undeveloped 4 acres for a trolley coach facility

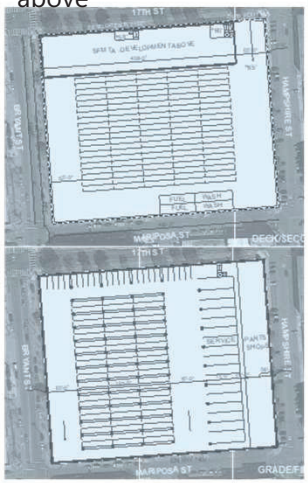
1399 Maintenance Facility

Build a trolley coach maintenance facility.



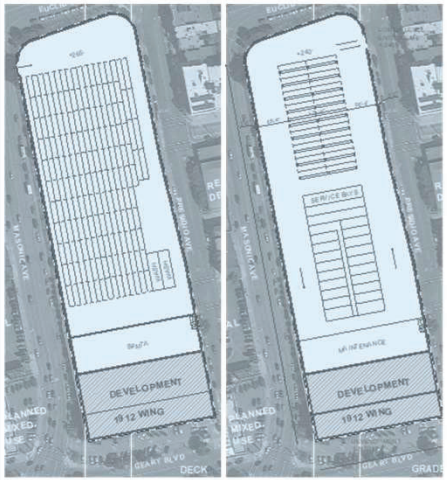
Potrero Yard

Rebuild as multi-level trolley and motor coach facility with private development above



Presidio Yard

Rebuild as multi-level trolley and Zero Emission Bus Facility with private development adjacent



Kirkland Yard

Modernize as a new Zero Emission Bus Facility

Modernization

UPDATED PROGRAM (2023)

Based on stormwater requirements, fleet movements and requirements on site, the maintenance component of the trolley facility was going to be placed at the 1399 Marin Facility.

Potrero Yard

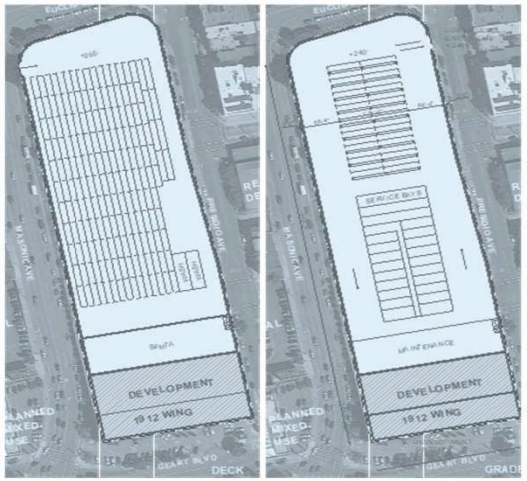
Rebuild as multi-level trolley and motor coach facility with private development above

Kirkland Yard

Modernize as a new Zero Emission Bus Facility

Presidio Yard

Rebuild as multi-level trolley and Zero Emission Bus Facility with private development adjacent



MME Expansion

Expand facility for rail storage.

Electrification

In February 2022, the SFMTA completed its **Battery Electric Bus Facilities Master Plan**.

- Established *projects and sequencing* for charging infrastructure.
- Preliminarily identified *power requirements*.
- Schedule based on current *aggressive regulatory requirements*.

Electrification

Electrification Program

- Kirkland Yard Electrification
- Woods Yard Pilot Phase II
- Islais Creek Pilot Phase I
- Presidio Yard Modernization

The Electrification Program readies the SFMTA for transition to Battery-Electric Bus.

- Reviewing fleet requirements.
- Negotiating regulatory conversion schedule.
- Formalizing Program Management.

Joint-Development

Joint-Development Program

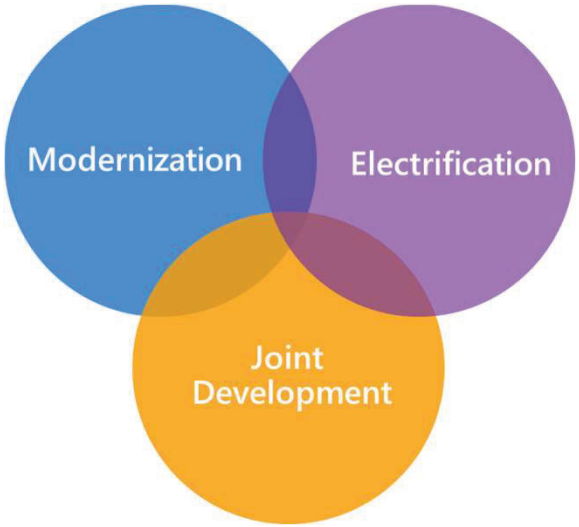
- Potrero Yard
- Presidio Yard
- Moscone Garage
- 5th and Mission Garage

The Joint-Development maximizes land-use to generate revenue for transportation.

- Advancing Potrero Yard Housing Project.
- Completed Caltrans Planning study for Presidio Yard; awaiting RAISE Grant.

Conclusion

A once in a generation opportunity.
BUILDING PROGRESS



The Building Progress Program represents a once in a generation opportunity to tackle major state of good repair needs, raise revenue for transportation and future proof our facilities campus to provide for the transportation needs of San Francisco today and tomorrow.

Contractor Procurement (Bus Yard Infrastructure)

Chris Jauregui, Potrero Neighborhood Collective (PNC)

Contractor Procurement Overview

As part of the Predevelopment Agreement (PDA), PNC is responsible for conducting early Contractor procurement. Contractor procurement is planned to occur in phases:

Bus Yard Infrastructure Facility (2023 - 2024)

- Two-step procurement that includes a Request for Qualification (RFQ) and Request for Proposals (RFP)
- Select up to four (4) Shortlist Respondents after RFQ
- Select one (1) Design & Construction (D&C) Contractor to design and construct the Bus Yard and Common Infrastructure.

Housing and Commercial Facility (Date TBD)

- Construction Manager / Owner's Representative (ex. permit applications and coordination, cost analysis, scope and schedule analysis, etc.) – role required by Mayor's Office of Housing and Community Development (MOHCD)
- To involve one or more separate contractor procurement processes

Contractor Procurement Schedule

PNC released a Request for Qualifications (RFQ) on July 5, 2023 for the Infrastructure Facility to prospective prime contractors.

Below identifies key milestone dates in the procurement of a Prime Contractor for the Bus Yard Infrastructure Facility:

Activity	Date
RFQ released to Respondents	July 5, 2023
Deadline for submission of SOQs ("SOQ Due Date")	September 1, 2023 at 2:00PM PT
Interviews (if required)	August / September 2023
Anticipated selection of Shortlisted Respondents*	September 2023
Anticipated release of draft RFP*	October 2023
LBE Contractor Outreach Event	TBD
Anticipated Proposal due date*	January / February 2024
Anticipated Preferred Proposer selection*	February / March 2024

Procurement schedule is subject to change.

Contractor Procurement Evaluation Criteria

Contractor responses to the RFQ will be reviewed based on established evaluation criteria including:

- Financial and Bonding Capacity (25%)
- Relevant Experience (40%)
- Key Personnel (15%)
- Project Approach (20%)

Review process:

1. Responsiveness to RFQ Requirements Review
2. Review of Administrative Submission to determine whether Respondent has provided all required forms
3. Statement of Qualification Scoring using the established evaluation criteria

Contractor Procurement Key Aspects

- Contractual structure includes Arcadis/IBI Group as Architect
- Compliance with the Environmental Impact Report (EIR) Mitigation Monitoring and Reporting Program (MMRP)
- No contractor obligation to finance any portion of the Project
- Local Hire Policy, SFMTA Employee Trainee program and other related requirements enforced
- Accept obligations of any Project Labor Agreement(s) that may apply to Project
- Continued public engagement, including with the Potrero Yard Neighborhood Working Group
- Local Business Enterprise (LBE) utilization and related requirements enforced

This is not an exhaustive list of Infrastructure Facility Contractor requirements. The Request for Qualifications (RFQ) further details respondent requirements.

Economic Inclusion through Local Businesses and Residents

Local Business Enterprise (LBE)

PNC prioritizes LBE participation during the Pre-Development and Project Agreement phases.

- **6** Certified LBEs supporting PNC during Predevelopment phase (to date)
- **20%+** LBE participation goal during D&C period
- ✓ Consideration of all LBEs including those located in/around Project area and those certified as Micro LBEs

Local Hiring and Related Workforce

PNC will maximize SF residents working on Potrero Yard by requiring selected contractor to participate in:

- SFMTA's Employment Training Program
- City's First Source Hiring Program
- City's Local Hiring Policy
- Workforce Development Program(s) focused on most disadvantaged communities

Additionally, PNC is initiating conversations with relevant trade councils and unions about the Project.

POTRERO Neighborhood Collective

Local Business Enterprise (LBE) Utilization Plan

Jennifer Trotter, Potrero Neighborhood Collective (PNC)

LBE Participation

Maximizing LBE participation during Project Agreement phase in partnership with selected builder(s). Construction will be procured in phases with the Bus Yard Infrastructure facility being procured first.

Table 28-5: LBE Goals

	INFRASTRUCTURE LBE%	HCC LBE%
Design Work	25%	25%
Construction Work	20%	20%
Facility/Property Management	20%	20%

Listed goals are based on PNC's current trade analysis and existing commitments made with certified LBE partners. Goals may change based on ultimate subcontracting allocations and final design of Project.

The HCC is anticipated to be funded by multiple funding sources that may have differing supplier inclusion requirements.

LBE Certification and eligibility requirements can be found at https://sf.gov/departments/contract-monitoring-division

LBE – Predevelopment Agreement (PDA) Phase

PNC's LBE Utilization Plan is in *draft* form with plans to finalize prior to Prime Contractor selection for the Bus Yard Infrastructure facility. Additional updates may be presented to the SFMTA for approval at a later date.

During the PDA phase, PNC is prioritizing LBE inclusion by:

- Holding small group meetings with LBEs and LBE advocacy organizations to provide Project updates and overview of PNC's commitment to LBE inclusion.
- Requiring RFQ respondents to propose an early-stage approach to LBE inclusion and share past experience of including certified LBEs and/or other small, local, or disadvantaged businesses.
- Hosting an LBE outreach event with Prime Contractor bidders during the RFQ/RFP process.
- Providing LBEs with the list of Prime Contractor bidders that received the RFQ.

POTRERO Neighborhood Collective

LBE – Project Agreement (Bus Yard Infrastructure)

To meet LBE participation goals and maximize Micro-LBE inclusion, PNC expects Prime Contractor to:

- Conduct early and often outreaching to prospective LBEs, including targeted outreach to LBEs near the Project site and in City's most disadvantaged communities
- Bid out reduced sized scopes that allow Micro- and Small-LBEs to compete
- Provide assistance to LBEs (ex. mentoring / coaching, capacity building training)
- Identify consequences for non-LBE 1st tier contractors that do not have (sufficient) LBE participation
- Maintain LBE Liaison and Trucking Liaison (construction)
- Regularly report LBE participation to SFMTA
- Identify potential set-asides for micro-LBEs

Next Steps

Chris Jauregui, Potrero Neighborhood Collective (PNC)

Next Steps

PNC and the SFMTA have the following community outreach activities planned (subject to change):

- NOTE: previously scheduled CTA Community Advisory Council and CTA Board meetings will be rescheduled

- **Next Working Group meeting: August 8, 2023**

- Listening Sessions with various community stakeholders including (schedules pending, dates TBD)

- Briefings and focus group sessions with LBE (including Micro-LBE) advocacy organizations and LBEs (schedules pending, dates TBD)

BUILDING PROGRESS

Public Comment

- Do any members of the public wish to comment?
- If you are joining via a computer, please use the raise your hand feature and we will unmute you.
- Joining by phone? We will unmute folks one at a time and call out the last four digits of your phone number.

BUILDING PROGRESS

Contact Us

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Potrero Neighborhood Collective
PotreroYard@plenaryamericas.com
(new email address)

LBE Liaisons (Bus Yard Infrastructure)

PNC will maintain an LBE Liaison during the PDA and Project Agreement phases.

- Conduct early outreach to LBE community
- Confirm that Prime Contractor procurement documents include information about the LBE Program
- Confirm that selected Prime Contractor is utilizing LBEs for Commercial Useful Function (CUF), reporting LBE utilization, and confirming nondiscrimination in subcontracting
- Available to meet with the SFMTA Contract Compliance Office and Department of Public Works on any LBE issue

PNC will require selected Prime Contractor to maintain an LBE Liaison and Trucking Liaison.

- Prime Contractor LBE Liaison: monitor and report LBE utilization, conduct and document outreach efforts, support Micro-LBE inclusion particularly from City's most disadvantaged communities
- Trucking Liaison: determine and manage trucking needs, outreach to LBE trucking firms

POTRERO Neighborhood Collective

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Presidio Yard Modernization		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06b- Facilities and Guideways		
Second Prop L Program (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The Presidio Yard Modernization project is a reconstruction and modernization of a 110+ year old transit facility. The entire 5.4-acre site on Geary Boulevard between Presidio and Masonic avenues was last upgraded in 1950. The existing facility services 132 40' trolley buses. The site is planned to have a new Battery Electric Bus Facility that will service 215+ 40' and 60' Zero Emission/Electric Buses. Paratransit operations as well as mixed-use joint development are also planned for the property. This joint development is expected to generate revenues for capital improvements, maintenance, and transit service.		
Project Location and Limits:	949 Presidio Avenue (square block bounded by Presidio Ave., Geary Blvd., Masonic Ave. and Euclid Ave). Limits of impact = city wide on all bus routes that operate from the facility.		
Supervisorial District(s):	Citywide, District 02		
Is the project located on the 2022 Vision Zero High Injury Network ?	Yes	**Is the project located in an Equity Priority Community (EPC)?**	No
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	The Presidio Modernization Project is a new opportunity to rethink, rebuild and expand the current site into a multi-level modern bus operations and maintenance facility and adjacent mixed uses. It will also continue to house the SFMTA Peer Assistance program and the historic bus fleet. A new state-of-the-art facility will advance the city's goals of clean energy transit. Presidio Yard houses routes that serve communities all over the city, including neighborhoods in the Muni service equity strategy. For example, the 1 California serves the Chinatown neighborhood, and the 24 Divisadero serves Western Addition and Bayview Hunters Point neighborhoods. Updating Presidio Yard will improve transit for some of our most underserved communities. A modern Presidio Yard will support reliable transit service by improving maintenance and working conditions, getting buses back into service sooner. It will also improve street safety around the facility with updates to adjacent arterials to reduce traffic-related injuries and encourage walking, bicycling, and taking transit. As the facility is in a central location along a heavily traveled transit route, the project will explore potential joint development and mixed use opportunities with an innovative vision of leveraging joint development to generate additional revenues for the SFMTA and help fund Muni operations. The Presidio Modernization Project will replace a 100+ year old building that is too small and which is not configured for modern transit vehicles. The new facility will be built as a state of the art transit division and will include design elements that will make overall operations and maintenance much more efficient than doing the same tasks at the existing structure. This is one of five SFMTA bus facilities that are being rebuilt for the conversion from hybrid electric to Battery Electric Buses, as required by the California Air Resources Board.		

From the SFMTA's Potrero Project there have been lessons learned regarding the complexities and funding challenges of building a new bus and transit facility with housing proposed adjacent and above on the 4.4 acre parcel. There are many issues regarding coordinating the planning, financing, and construction of the bus facility versus housing and other commercial uses. For the Presidio Project on the 5.4 acre parcel, the SFMTA is proposing to subdivide it into two parcels: the larger parcel for the bus facility, other transit and transit uses, and a pedestrian crossing; the other parcel for residential and mixed use development. The two projects can coordinate and move forward with their planning, funding, predevelopment, and construction schedules.

The Public-Private Partnership (P3) Project Delivery Model goes as follows.
* Project is split into 2 parts: 1) Bus Yard , 2) Housing and Commercial
* Infrastructure developer partner will design, build and finance new facility, operate housing.
* DBFM: Finance and maintain components are critical for the SFMTA
* Risk transfer to well capitalized partner who can better manage financing "surprises" and interface between project components
* Improved speed to market through approach to design and contractual incentives

Timeline
* 2023-26 - Predevelopment, DEIR process, public outreach
* 2024-28 - Continuing predevelopment, FEIR, public outeach, project agreement / financing
* 2028-30 - Relocation of existing yard vehicles and staff, construction of new facility
* 2031 - Project complete - new division opens

The SFMTA launched the Building Progress Program in Fall 2017.
The Building Progress Program will:
* Modernize aging SFMTA facilities in order to meet the needs of everyone who travels in San Francisco;
* Improve the transportation system's resiliency to seismic events, climate change, technology changes; and
* Make the SFMTA a better neighbor in the parts of the city that currently host our facilities.

	A Look at Presidio Yard Before Covid 19 - 132,000 muni riders rely on buses from Presidio (18% of all Muni riders Existing Facility: 1.5 levels/132 buses/16 bus bays/450 staff Future Facility: 3 levels/215 buses/23 bus bays/900 staff Core Transportation Objectives * Rebuild and modernize Presidio Yard by 2031 * Provide infrastructure for battery electric (BEB) buses * Improve safety and working conditions for SFMTA workers * Consolidate functions for efficiencies Site / Housing Objectives * Enhance architecture and urban design * Enhance streetscape to ensure public safety and reduce conflicts * Maximize housing, including at least 50% affordable and up to 100% affordable Commitment to: * A responsible public investment, inclusive and transparent stakeholder engagement, and leadership in sustainability Stakeholder Engagement * Stakeholder engagement began in 2019 * 5 major public events held in 2021-2023 * Virtual meetings during COVID * Live events returned in late 2021 - tabling events - continue into 2023 * Public yard tours begin again in 2023 For more information, please visit SFMTA.com/PresidioYard.
Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Attachment 1: RAISE Letters of Support Attachment 2: RAISE Application Package Attachment 3: Fact Sheet
Type of Environmental Clearance Required:	EIR, EIS
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	San Francisco Public Works - Tim Kempf, Project Mgr. IV

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Delivery Milestones	Status	Work	Start Date		End Date	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	10%	In-house and Contracted	Q1-Jul-Aug-Sep	2020/21	Q2-Oct-Nov-Dec	2026/27
Environmental Studies (PA&ED)	0%	In-house and Contracted	Q1-Jul-Aug-Sep	2024/25	Q1-Jul-Aug-Sep	2026/27
Right of Way	N/A	TBD				
Design Engineering (PS&E)	5%	In-house and Contracted	Q3-Jan-Feb-Mar	2024/25	Q2-Oct-Nov-Dec	2026/27
Advertise Construction	0%	In-house	Q3-Jan-Feb-Mar	2026/27		
Start Construction (e.g. Award Contract)	0%	In-house	Q2-Oct-Nov-Dec	2027/28		
Operations (i.e. paratransit)	0%	In-house	Q2-Oct-Nov-Dec	2030/31	Q2-Oct-Nov-Dec	2030/31
Open for Use	0%	In-house and Contracted			Q2-Oct-Nov-Dec	2030/31
Project Completion (means last eligible expenditure)	0%	In-house and Contracted			Q2-Oct-Nov-Dec	2030/31

Notes

Schedule is depending upon funding availability.

Prop L Sales Tax Program
Project Information Form (PIF) Template

Project Name:	Presidio Yard Modernization

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 26,993,755	$ 5,150,000	$ 21,843,755	Engineer's Estimate
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 33,194,000	$ -	$ 33,194,000	Based on Current Portrero Yard Estimates
Construction	$ 394,956,000	$ -	$ 394,956,000	SFMTA 2021 Capital Plan + 6% escalation
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 455,143,755	$ 5,150,000	$ 449,993,755	
Percent of Total		**1%**	**99%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
RM3		Planning/Conceptual Engineering	Programmed	2023/24	$12,594,945	$ -		$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Planning/Conceptual Engineering	Planned	2023/24	$ 5,150,000	$ -	$450,000	$1,700,000	$3,000,000	$ -
FTA/RAISE		Planning/Conceptual Engineering	Planned	2024/25	$ 9,248,810	$ -	$ -	$ -	$ -	$ -
TBD		Design Engineering (PS&E)	Planned	2026/27	$ 33,194,000	$ -	$ -	$ -	$ -	$ -
TBD		Construction	Planned	2027/28	$ 394,956,000	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 455,143,755**	**$ -**	**$ 450,000**	**$ 1,700,000**	**$ 3,000,000**	**$ -**

Notes

TBD fund sources include: Federal Raise Grant, City and County of San Francisco General Obligation Bond Funds, FTA Bus and Bus Facility Grant Program, FTA No and Low Emission Vehicles Program, CA State Transit and Inner City Rail Program, Proposition B, SFMTA Capital Funds (i.e., one-time operating funds for capital).

SFMTA received a Caltrans grant to begin initial planning for the Presidio Modernization Project. The funding helped hire Hatch/HDR Consultants to plan the Bus Facility and start inreach with SFMTA Operations and Maintenance staff. The SFMTA also looked at development scenarios if the 5.4 acre is subdivided into separate parcels for the Bus Facility and midblock pedestrian crossing, and separate parcels for residential and commercial uses.

The proposed request also funds ($150,000) enhanced oversight by the Transportation Authority in recognition of the scale and impact of this project, as well as the planned P3 delivery method.

Prop L Sales Tax Program
Project Information Form (PIF) Template

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Presidio Yard Modernization***
Relative Level of Need or Urgency (time sensitive)	This project is an urgent need. If we do not get the funding requested - the project will be delayed. The facility is over 110 years old and is not seismically sound. Its continued operation is critical for transit operations at SFMTA. It is vital that while the project is being built, all trolleybuses located at this facility will be sent (along with operators and maintenance staff) to other divisions so they can continue in active service. This facility will be converted to an all battery electric bus (BEB) facility and is essential for the SFMTA to be able to transition to 100% zero emissions buses to comply with CARB regulations. Any delay could impact our ability to procure BEBs. This is the fourth major project of the Building Progress program that will rebuild multiple SFMTA facility structures over the next decade and beyond.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	The project has support from a diverse group of stakeholders that includes a coalition of elected officials (Sen. Feinstein, Rep. Pelosi, Sen. Wiener, Assemblymembers Haney and Ting, Mayor Breed, Sup. Stefani), government agencies (Caltrans, MTC, City Planning, OEWD) and community organizations (SPUR, TransForm, Bicycle Coalition, WalkSF, SF Transit Riders). Additional outreach with the surrounding community will accompany the planning phases funded by Prop L. The SFMTA has hosted in-reach events in the form of open house/workshops for operations and maintenance staff to socialize the project with front-line staff and get their feedback via feedback surveys. We have also conducted yard tours for elected officials. We have tabled staff events, such as the Muni Roadeo, and handed out fact sheets on the project.
Benefits to Disadvantaged Populations and Equity Priority Communities	The transit service that originates at the Presidio Division is operated to all parts of San Francisco - serving multiple equity priority communities, including Western Addition, the Tenderloin, South of Market, Chinatown, the Mission, and the Bayview neighborhoods. A modern Presidio Yard will improve the reliability and frequency of transit by getting buses back into service sooner. These improvements will benefit residents of equity priority communities the most as they are more dependent on transit. For example 70% of residents in Chinatown do not own a vehicle and must rely on the transit based at the Presidio Yard. Presidio Yard is also located a few blocks from the Western Addition neighborhood, and affordable housing is adjacent to the site: the Presidio Yard is across the street from an affordable housing development for transition-age youth (youth who are leaving foster care) and is two blocks from a 136-unit public housing development serving low-income families. These neighboring communities will also benefit from improved street safety around the facility with updates to adjacent arterials to reduce traffic-related injuries and make walking, bicycling, and taking transit safer.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Safety and Livability, Equity, Environmental Sustainability, Economic Vitality
	The trolleybuses that operate from the Presidio Division serve 14 routes (pre Covid) that reach all parts of the city, including several disadvantaged neighborhoods. Pre-Covid these buses carried an average of 132,000 passengers per day providing mobility on journey to work trips, medical trips, school trips, recreation trips and other trips. The investment in a new facility is expected to benefit all of San Francisco for the next 100+ years.

The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	The Presidio Yard Modernization Project is an exciting opportunity to rethink, rebuild and expand the current site into a multi-level modern bus operations and maintenance facility and adjacent mixed uses. It will also continue to house the SFMTA Peer Assistance program and our historic bus fleet. A new state-of-the-art facility will advance the city's goals of clean energy transit. Presidio Yard houses routes that serve communities all over the city, including neighborhoods in the Muni service equity strategy. For example, the 1 California serves the Chinatown neighborhood, and the 24 Divisadero serves Western Addition and Bayview Hunters Point neighborhoods. Updating Presidio Yard will improve transit for some of our most underserved communities.
Need (Asset Useful Life) (Vehicles Sub-program)	N/A
Improves Efficiency of Transit Operations (Vehicles Sub-program)	N/A
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	Over the last several years, the SFMTA has replaced its bus fleet to provide an improved modern transportation system, yet the majority of facilities supporting those investments are well beyond their useful life. The existing Presidio Yard, located at Geary Boulevard and Presidio Avenue, was constructed in 1912 as a streetcar facility and is no longer suitable for modern bus maintenance. The facility is structurally unsound, obsolete, and must be rebuilt. The rebuild of the transit facility will provide infrastructure for a 100 percent zero-emission, all battery-electric fleet, in accordance with the SFMTA's Zero Emission transition plan.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	A modern Presidio Yard will support reliable transit service by improving maintenance and working conditions, getting buses back into service sooner. It will also improve street safety around the facility with updates to adjacent arterials to reduce traffic-related injuries and encourage walking, bicycling, and taking transit.

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name and Sponsor			
Project Name:	Woods/Islais Creek Yard Electrification Phase I		
Implementing Agency:	SFMTA		
Prop L Expenditure Plan Information			
Prop L Program:	06- Muni Transit Maintenance, Rehabilitation, and Replacement		
Prop L Sub-Program (if applicable):	06b- Facilities and Guideways		
Second Prop L Program (if applicable):			
Project Information			
Brief Project Description for MyStreetSF (80 words max):	The project consists of the installation of inverted pantograph battery electric bus (BEB) charging infrastructure and related charging equipment at two SFMTA bus yards for the purpose of transitioning Muni's bus fleet of bio-diesel/hybrid buses to battery-electric. The project entails the installation of 12 charging stations and 6 charging stations at the Woods and Islais Creek facilities, respectively, that will be supported by a structural steel frame and overhead gantry infrastructure, electrical distribution equipment, and an elevated platform for the electrical equipment.		
Project Location and Limits:	The Islais Creek Muni/Motor Coach Facility is located at 1301 Cesar Chavez Street, San Francisco, CA. The facility is located in the Dogpatch neighborhood bounded by Indiana Street (to the east), Islais Creek waterfront (to the south), Rte 280 or John F. Foran Freeway (to the west) and Cesar Chavez Street (to the north). The Woods Bus Yard is located at 1095 Indiana Street, San Francisco, CA. The facility is located in the in the Dogpatch neighborhood bounded by Indiana Street (to the east), 23rd Street (to the south), Iowa Street (to the west), and 22nd Street (to the north).		
Supervisorial District(s):	Citywide		
Is the project located on the 2022 Vision Zero High Injury Network ?	No	**Is the project located in an Equity Priority Community (EPC)?**	No
Which EPC(s) is the project located in?			
Detailed Scope (may attach Word document): Please describe in detail the project scope, any planned community engagement, benefits, considerations for climate adaptation and resilience (if relevant), and coordination with other projects in the area (e.g. paving, Vision Zero).	The Islais Creek and Woods BEB transition program is the first phase of the installation of required EV-ready infrastructure and BEB charging equipment to accompany the expansion procurement of BEBs (expanding Muni's fleet of 60' buses) and starting the process of transitioning Muni's fleet of 224 60-ft bio-diesel/hybrid buses to a battery-electric bus (BEB) fleet by 2040. At the Woods Yard, the project entails the installation of 12 charging stations with inverted pantograph type from the overhead infrastructure; providing power link, controller, and structural steel frame for pantograph and providing an overhead gantry infrastructure to support pantographs and elevated platform for the EV electrical equipment. At the Islais Creek Yard, the project involves the installation of 6 charging stations with inverted pantograph type from the overhead infrastructure; 600V distribution and equipment; 3 600V switchboard feeders to EV CC's and power cabinets; underground		

	[illegible] electrical service connection, electrical conduits / wiring for pantographs; and overhead gantry infrastructure to support the pantograph. The project is part of the SFMTA Strategic Plan to meet its goal to eliminate pollution and greenhouse gas emissions by moving away from diesel-hybrid buses and adopting zero-emissions buses. Phase 1 initiative will meet the CARB (California Air Resource Board) Innovative Clean Transit (ICT) regulation to operate 100% zero transmission buses by 2040 and comply with the intent of the CARB ICT bus procurement requirements. We will kick off the project as part of our commitment to public outreach and engagement. Additional information will be continually provided by the SFMTA Public Outreach and Engagement Team (POETs) to the Dogpatch Neighborhood associations and other external stakeholders with the inception of the design and through construction. The Islais Creek Facility is situated in the Sea Level Rise Vulnerability Zone. Under the Port of San Francisco Resilience Program, the Port in partnership with SFMTA, U.S. Army Corps of Engineers, and other City agencies are developing a Draft Waterfront Adaptation Plan. The plan will identify a preferred approach to reduce flood risks from sea level rise and extreme storms. Possible strategies in the plan could include raising the shoreline along roadways and facilities with a seawall (LOD E), introducing a land berm coupled with pumping the sea level rise water (LOD F), and considering relocation of the facility and/or centralization strategies in consideration with "retreating" to higher ground (LOD G). https://sfport.com/wrp/waterfront-adaptation These issues require a broader collaboration with the Port of San Francisco Resilience Program. It requires a coordinated mitigation plan that is long in development, hence the current plan is for this to be addressed when the Islais Creek Facility is scheduled to be fully converted to a BEB bus yard facility in 2040. Workshops are underway between the SFMTA and Port agencies in the discussion of the proposed strategies.

Attachments: Please attach maps, drawings, photos of current conditions, etc. to support understanding of the project.	Attachment 1: SFMTA Battery Electric Bus Roll-Out Plan, July 2022; SFMTA Zero Emission Transition Plan-2022 Extracts: Attachment 2: Task 2 Facility Power Needs & Technical Assessment Report, Attachment 3: Task 3 Appendix A-E (BEB Launch Phase), and Attachment 4: Task 3 Implementation Facility Master Plan Chapter 5 Islais Creek Yard. Attachment 5: Map District 10 (2022), Islais Creek Motor Coach Facility (August 2012) Attachment 6: Draft Waterfront Adaptation Strategies FAQ (10/25/22) Attachment 7: Letters of Support
Type of Environmental Clearance Required:	Categorically Exempt
Coordinating Agencies: Please list partner agencies and identify a staff contact at each agency.	SF Public Utility Commission (PUC); SF Port Waterfront Resiliency (Tim Doherty, SFMTA liaison); Pacific Gas & Electric (PG&E); SF Planning Department; SF Department of Building Inspections (DBI); SF Fire Department (SFFD); SF Public Works - Site Assessment and Remediation (SAR); SF Department of the Environment.

Project Delivery Milestones	**Status**	**Work**	**Start Date**		**End Date**	
Phase	**% Complete**	**In-house - Contracted - Both**	**Quarter**	**Fiscal Year (starts July 1)**	**Quarter**	**Fiscal Year (starts July 1)**
Planning/Conceptual Engineering	0%	In-house and Contracted	Q2-Oct-Nov-Dec	2023/24	Q3-Jan-Feb-Mar	2023/24
Environmental Studies (PA&ED)	0%	Contracted	Q1-Jul-Aug-Sep	2023/24	Q2-Oct-Nov-Dec	2024/25
Right of Way	0%	TBD				
Design Engineering (PS&E)	0%	In-house and Contracted	Q4-Apr-May-Jun	2023/24	Q2-Oct-Nov-Dec	2024/25
Advertise Construction	0%	TBD	Q2-Oct-Nov-Dec	2024/25		
Start Construction (e.g. Award Contract)	0%	TBD	Q3-Jan-Feb-Mar	2024/25		
Operations (i.e. paratransit)	0%	TBD				
Open for Use	0%	TBD				
Project Completion (means last eligible expenditure)	0%	TBD			Q2-Oct-Nov-Dec	2025/26

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

San Francisco County Transportation Authority

Project Name:	Woods/Islais Creek Yard Electrification Phase I

Project Cost Estimate		**Funding Source**		
Phase	**Cost**	**Prop L**	**Other**	**Source of Cost Estimate**
Planning/Conceptual Engineering	$ 1,939,788	$ -	$ 1,939,788	Engineer's estimate based on cost of construction
Environmental Studies (PA&ED)	$ -	$ -	$ -	
Right of Way	$ -	$ -	$ -	
Design Engineering (PS&E)	$ 5,027,239	$ 3,108,000	$ 1,919,239	Engineer's estimate based on cost of construction
Construction	$ 30,693,700	$ -	$ 30,693,700	Engineer's estimate based on recent electrical equipment costs, additional construction hard cost based on similar projects, and project duration
Operations (i.e. paratransit)	$ -	$ -	$ -	
Total Project Cost	$ 37,660,727	$ 3,108,000	$ 34,552,727	
Percent of Total		**8%**	**92%**	

Funding Plan - All Phases - All Sources

Cash Flow for Prop L Only (i.e. Fiscal Year of Reimbursement)

Fund Source	**Prop L Program**	**Phase**	**Fund Source Status**	**Fiscal Year of Allocation (Programming Year)**	**Total Funding**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**2027/28**
SB1 SGR		Planning/Conceptual Engineering	Programmed	2023/24	$ 1,901,274	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Planning/Conceptual Engineering	Programmed	2023/24	$ 38,514	$ -	$ -	$ -	$ -	$ -
Prop L	06- Muni Transit Maintenance, Rehabilitation, and Replacement	Design Engineering (PS&E)	Planned	2023/24	$ 3,108,000	$ -	$ 1,600,000	$ 1,500,000	$ 8,000	$ -
SB1 SGR		Design Engineering (PS&E)	Programmed	2023/24	$ 1,462,578	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Design Engineering (PS&E)	Programmed	2024/25	$ 456,661	$ -	$ -	$ -	$ -	$ -
SB1 SGR		Construction	Programmed	2024/25	$ 565,322	$ -	$ -	$ -	$ -	$ -
5339 Bus & Bus Facilities		Construction	Programmed	2024/25	$ 30,128,378	$ -	$ -	$ -	$ -	$ -
				Total By Fiscal Year	**$ 37,660,727**	**$ -**	**$ 1,600,000**	**$ 1,500,000**	**$ 8,000**	**$ -**

Notes

Prop L Sales Tax Program
Project Information Form (PIF) Template

Prop L Supplemental Information Please fill out each question listed below (rows 2-8) for all projects.	
Project Name	***Woods/Islais Creek Yard Electrification Phase I***
Relative Level of Need or Urgency (time sensitive)	In accordance with the California Air Resource Board's (CARB) Innovative Clean Transit regulation (ICT regulation), the following report serves as the San Francisco Municipal Transportation Agency's (SFMTA) Rollout Plan to transition its bus fleet to 100% zero-emission (ZE) by 2040. Effective October 1, 2019, the ICT regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size. ICT regulation does not apply to overhead catenary trolley buses (ZETB), but they are a part of zero-emission vehicles. To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies, to submit a ZEB Rollout Plan before purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components and must be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to CARB. According to the ICT regulation, each agency's requirements are based on its classification as either a "Large" or "Small" transit agency. The SFMTA, as a Large Transit Agency must comply with the following requirements: July 1, 2020 – Board of Directors (Board) approved Rollout Plan must be submitted to CARB January 1, 2023 – 25% of all new bus purchases must be ZE January 1, 2026 – 50% of all new bus purchases must be ZE January 1, 2029 – 100% of all new bus purchases must be ZE January 1, 2040 – 100% of fleet must be ZE March 2021 – March 2050: Annual compliance report due to CARB This project will include the installation of overhead pantographs and ground mounted charging equipment as well as replacing the existing asphalt yard parking pavement with concrete/AC pavement for the additional parking six articulated BEBs. The relative need and urgency is high. The BEB procurement is underway for the initial purchases of vehicles to comply with the 25% target. Very much related to the vehicle is the conversion of bus facilities such as Islais Creek Motor Coach Facility to be ready by 2024-2025 to charge and store this initial pilot fleet of BEB's as the SFMTA fleet is replacing its diesel hybrid buses.
Prior Community Engagement/Level and Diversity of Community Support (may attach Word document):	There is widespread support across federal, state and local levels regarding the transition to zero emissions vehicles, and this project is critical to expanding the SFMTA's electric bus charging capacity. The SFMTA Board has adopted a resolution committing to transitioning to an all-electric bus fleet. In furtherance of this resolution and the goals of the City's Climate Action Plan and California's Innovative Clean Transit regulations, in March 2021, the SFMTA Board adopted the Zero Emissions Bus Rollout Plan to achieve its goal of a 100% zero emission fleet by 2040. This project has recieved letters of support for funding grants from US Senators Alex Padilla and Dianne Feinstein, Mayor London Breed, City Supervisors Aaron Peskin and Shamann Walton, and the San Francisco Transit Riders organization.

Benefits to Disadvantaged Populations and Equity Priority Communities	In San Francisco, 1/5th of the population in the Muni service area earns less than 200% of the federal poverty level. A Title VI analysis showed that the new service plan impacted 813,234 people, 24% of whom are low-income and 58% of whom are people of color. Expanding the 60' bus fleet, especially with zero emission buses, will support the Muni Forward program of reducing headways and increasing service reliability and speed. This will primarily benefit these transit dependent riders. Expanding the 60' bus fleet will enable higher service levels on the major routes that serve disadvantaged communities, such as Bayview-Hunters Point (concentration of Black families), Chinatown (Chinese) and the Mission (Hispanic) as these communities are served by major 60' bus routes, including the 30 Stockton (ridership is 7,702,400), 14 Mission (ridership = 9,566,000), and the 9 San Bruno (ridership = 3,071,900). And, residents earning < 200% poverty level qualify for 50% fare reduction.
Compatability with Land Use, Design Standards, and Planned Growth	Yes
San Francisco Transportation Plan Alignment (SFTP)	Environmental Sustainability, Equity
	The Woods and Islais Creek Facilities are located in the Dogpatch neighborhood, a historically disadvantaged community. Converting up to 153 diesel hybrids to zero emission vehicles will significantly benefit the residents of the community by reducing emissions and greenhouse gases. In addition, the conversion to BEB supports reducing reliance on oil. The investment priority identified in SFTP 2050 advance transportation projects and programs to provide Cleaner Air. Vehicle miles traveled by the BEBs will be electrified helping cut greenhouse gases (GHG).
The next section includes criteria that are specific to each Expenditure Plan program. The questions that are required to be filled out for each program will auto-populate once the Prop L program is selected on the Scope & Schedule tab.	
06- Muni Transit Maintenance, Rehabilitation, and Replacement	
Safety	This project allows the SFMTA to expand the number of battery electric buses we have in service. These new BEBs feature collision avoidance technology that improves safety for passengers and operators, making our streets safer. Otherwise, we have found the BEBs we are piloting to be just as safe as our current fleet.
Need (Asset Useful Life) (Facilities and Guideways Sub-program)	The project is meant to assist with transitioning Muni's fleet of 224 60-ft bio-diesel/hybrid buses to a battery-electric bus (BEB) fleet by 2040. This scope of this project is to construct the charging infrastructure needed for the new BEBs.
Improves Efficiency of Transit Operations (Facilities and Guideways Sub-program)	The project is part of the SFMTA Strategic Plan to meet its goal to eliminate pollution and greenhouse gas emissions by moving away from diesel-hybrid buses and adopting zero-emissions buses. Phase 1 initiative will meet the CARB (California Air Resource Board) Innovative Clean Transit (ICT) regulation to operate 100% zero transmission buses by 2040 and comply with the intent of the CARB ICT bus procurement requirements.

Zero-Emission Bus Rollout Plan

Prepared for:

CALIFORNIA AIR RESOURCES BOARD

Prepared By:

wsp

SFMTA

Rollout Plan Revision History			
Revision Number	**Editor**	**Date**	**Notes**
0	Bhavin Khatri	5/14/21	Final release
1	Ivan Magana	07/06/22	Edits to Fleet Procurement schedule and Facilities schedule

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Acronyms & Abbreviations

BEB	Battery Electric Bus
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CNG	Compressed Natural Gas
DAC	Disadvantaged Community
DHEB	Diesel-Hybrid Electric Bus
FCEB	Fuel Cell Electric Bus
ICEB	Internal Combustion Engine Bus
ICT	Innovative Clean Transit
kW(h)	Kilowatt (hour)
MME	Muni Metro East
O&M	Operations & Maintenance
OCS	Overhead Catenary System
PG&E	Pacific Gas & Electric
RNG	Renewable Natural Gas
SMR	Steam-Methane Reform
SFPUC	San Francisco Public Utilities Commission
SFMTA	San Francisco Municipal Transportation Agency
FTA	Federal Transit Administration
WDT	Wholesale Distribution Tariff
ZE	Zero-Emission
ZEB	Zero-Emission Bus
ZETB	Zero-Emission Trolley Bus

1 Rollout Plan Summary

Agency Background	
Transit Agency's Name	San Francisco Municipal Transportation Agency
Mailing Address	1 S. Van Ness Avenue San Francisco, CA 94105
Transit Agency's Air District	Bay Area Air Quality Management District
Transit Agency's Air Basin	San Francisco
Total number of Buses in Annual Maximum Service	680[1]
Urbanized Area	San Francisco - Oakland
Population of Urbanized Area	3,557,982[2]
Contact information of general manager, chief operating officer, or equivalent	Jeffrey Tumlin Director of Transportation 415.646.2522 mailto:XXXXX@sfmta.comjeffrey.tumlin@sfmta.com
Rollout Plan Content	
Is your transit agency part of a Joint Group[3]	No
Is your transit agency submitting a separate Rollout Plan specific to your agency, or will one Rollout Plan be submitted for all participating members of the Joint Group?	N/A
Please provide a complete list of the transit agencies that are members of the Joint Group (optional)	N/A
Contact information of general manager, chief operating officer, or equivalent staff member for each participating transit agency member	N/A
Does Rollout Plan have a goal of full transition to ZE technology by 2040 that avoids early retirement of conventional transit buses?	Yes
Rollout Plan Development and Approval	
Rollout Plan's approval date	03-16-21
Resolution No.	210316-038
Is copy of Board-approved resolution attached to the Rollout Plan?	Yes (Appendix A)
Contact for Rollout Plan follow-up questions	Bhavin Khatri, PE, PMP Zero Emission Program Manager 415.646.2586 bhavin.khatri@sfmta.com
Who created the Rollout Plan?	Consultant
Consultant	WSP

[1] This is based on January 2020 (pre-COVID) service.
[2] ACS 2019 (https://censusreporter.org/profiles/40000US78904-san-francisco-oakland-ca-urbanized-area/)
[3] The ICT regulation defines a Joint ZEB Group or Joint Group (13 CCR § 2023.2) as two or more transit agencies that choose to form a group to comply collectively with the ZEB requirements of section 2023.1 of the ICT regulation.

2 Introduction

In accordance with the California Air Resource Board's (CARB) Innovative Clean Transit regulation (ICT regulation), the following report serves as the San Francisco Municipal Transportation Agency's (SFMTA) Rollout Plan to transition its bus fleet to 100% zero-emission (ZE) by 2040.

2.1 Background

2.1.1 California Air Resource Board's Innovative Clean Transit Regulation

Effective October 1, 2019, the ICT regulation requires all public transit agencies in the state to transition from internal combustion engine buses (ICEBs) to zero-emission buses (ZEBs), such as battery-electric (BEB) or fuel cell electric (FCEB), by 2040. The regulation requires a progressive increase of an agency's new bus purchases to be ZEBs based on its fleet size.

ICT regulation does not apply to overhead catenary trolley buses (ZETB), but they are a part of zero-emission vehicles.

To ensure that each agency has a strategy to comply with the 2040 requirement, the ICT regulation requires each agency, or a coalition of agencies, to submit a ZEB Rollout Plan before purchase requirements take effect. The Rollout Plan is considered a living document and is meant to guide the implementation of ZEB fleets and help transit agencies work through many of the potential challenges and explore solutions. Each Rollout Plan must include several required components and must be approved by the transit agency's governing body through the adoption of a resolution, prior to submission to CARB.

According to the ICT regulation, each agency's requirements are based on its classification as either a "Large" or "Small" transit agency. The ICT defines a Large Transit Agency as an agency that operates in the South Coast or the San Joaquin Valley Air Basin and operates more than 65 buses in annual maximum service or it operates outside of these regions, but in an urbanized area with a population of at least 200,000 and has at least 100 buses in annual maximum service. A Small Transit Agency is an agency that doesn't meet the above criteria.

The SFMTA, as a Large Transit Agency must comply with the following requirements:

July 1, 2020 – Board of Directors (Board) approved Rollout Plan must be submitted to CARB

January 1, 2023 – 25% of all new bus purchases must be ZE

January 1, 2026 – 50% of all new bus purchases must be ZE

January 1, 2029 – 100% of all new bus purchases must be ZE

January 1, 2040 – 100% of fleet must be ZE

March 2021 – **March 2050** – Annual compliance report due to CARB

Due to the impacts of COVID-19, the SFMTA requested and was granted an extension for the submission of the Rollout Plan to March 31, 2021. The purpose of this request was to ensure that critical items such as the SFMTA's direction and decisions on trolley buses, yard rebuilds, stakeholder engagement, and future funding were included in the analysis to define the framework of its ZEB transition more accurately.

2.1.2 Zero-Emission Bus Technologies

According to the ICT regulation, a ZEB is a bus with zero tailpipe emissions and is either a BEB or a FCEB. The following subsections provide a brief overview of each technology and how they compare to ICEBs. While both BEB and FCEB technologies provide ZE benefits, the feasibility and viability of their application is largely based on an agency's service and operational parameters. The following provides a brief overview of BEB and FCEB technologies.

Battery-Electric Buses (BEBs)

BEBs use onboard batteries to store and distribute energy to power an electric motor and other onboard systems. Similar to many other battery-powered products, BEBs must be charged for a period of time to be operational.

BEB charging technology exists to charge vehicles at the yard (overnight or midday) or on-route (typically during layovers). A yard charging strategy typically consists of buses with high-capacity (kilowatt-hour or kWh) battery packs that are charged for four to eight hours with "slow" chargers - usually less than 100 kilowatts (kW) – while being stored overnight. An on-route charging strategy typically consists of buses with low-capacity battery packs that are charged with "fast" chargers – usually in excess of 100 kW – during bus layovers (typically 5-20 minutes). BEBs are charged via several dispenser types (conductive and inductive) and orientations (overhead or ground-mounted). The most common dispensers in the U.S. market are plug-in and pantographs, as presented in Figure 2-1.

Figure 2-1. Plug-In and Pantograph Charging

Sources: YorkMix (Left) and ABB (formerly ASEA Brown Boveri) (Right)

Under existing conditions, BEBs cannot meet the ranges that ICEBs can. BEBs typically have a range of 125-150 miles, which is highly dependent on a myriad of factors, including climate, driving behavior, and topography. For this reason, if an agency's service blocks cannot be completed with BEBs, other capital-intensive strategies may be needed to meet range requirements, including, but not limited to additional BEBs, on-route charging infrastructure, service changes, and/or a mixed-fleet strategy with the incorporation of FCEBs.

Fuel Cell Electric Buses (FCEBs)

FCEBs can typically replace ICEBs at a 1:1 replacement ratio without significant changes to operations and service. A FCEB uses hydrogen and oxygen to produce electricity through an electrochemical reaction to power the propulsion system and auxiliary equipment. This ZE process has only water vapor as a byproduct. The fuel cell is generally used in conjunction with a battery, which supplements the fuel cell's power during peak loads and stores electricity that is recaptured through regenerative braking, allowing for better fuel economy.

The process, operations, and equipment used to refuel hydrogen buses is similar to "lighter-than-air" fuels such as compressed natural gas (CNG). Typically, hydrogen is produced via steam-methane reform (SMR) or electrolysis. SMR, the most common method of producing hydrogen, uses high-pressure steam to produce hydrogen from a methane source, such as natural gas. Electrolysis, on the other hand, uses an electric current to decompose water into hydrogen and oxygen. After the hydrogen is produced, it can be delivered to the site via pipeline or delivered by a truck (as either a gas or liquid). Hydrogen is then stored, compressed, and dispensed to the buses on-site. Depending on space availability and resources, some agencies can produce hydrogen on-site.

Some of the most pressing challenges for FCEB operations is the limited supply network and the amount of energy, space, and high capital costs required to isolate, compress, and store hydrogen. Also, if renewable natural gas (RNG) - such as methane capture from organic matter – is not used as an alternative to natural gas via SMR operations, there are some concerns that FCEBs may not be the most sustainable vehicle to achieve GHG targets.

2.1.3 ZEB Suitability for the SFMTA's Service and Operations

The choice between adopting BEBs or FCEBs is contingent on the unique needs and conditions of an agency. Several variables need to be factored into this decision, including costs associated with bus acquisitions and associated infrastructure, spatial requirements, energy/fuel costs, and community acceptance. Based on existing conditions and the stated variables, BEBs appear to be the most suitable technology for the SFMTA to meet the requirements of the ICT regulation. The following provides a brief summary of the main findings of this analysis:

BEBs are more affordable than FCEBs at this time. There are barriers to entry for both BEBs and FCEBs, with both technologies exceeding the cost ICEBs. However, BEBs have achieved better economies of scale and are currently significantly less expensive than FCEBs.

The SFMTA's bus facilities are too space-constrained to accommodate FCEB-supporting infrastructure. Infrastructure to support BEBs (charging cabinets, dispensers, and associated utility equipment) can all be contained within the SFMTA's yard (either elevated or ground-mounted). In contrast, the infrastructure required for FCEBs (storage tanks, dispensers, etc.) requires a large footprint due to sizing and the National Fire Protection Association's (NFPA) required buffers. For example, a 15,000-gallon vertical hydrogen storage tank has a footprint of approximately 40 by 50 feet (not including the fueling island). This same tank would need to be located at least 75 feet from all air intakes, 50 feet from liquid or gas lines, and at least 25 feet from public ways, railroads, and property lines due to NFPA requirements. With the SFMTA's yards already being space-constrained in an urban environment, the SFMTA would risk losing a lot of potential bus parking – assuming that the infrastructure complies with NFPA requirements.

The SFMTA's existing rates for electricity are very competitive. With exceptionally low energy costs, powering BEBs is expected to be significantly less expensive than supplying hydrogen via liquid delivery. Hydrogen costs currently average around $8/kg and can have wide variability depending on local production supply and distance from the chosen supplier.

Hydrogen operations in the SF's dense neighborhoods may be a barrier to public acceptance. BEBs are widely accepted by communities and supported in terms of sustainability initiatives by both cities and transit agencies alike. This is in large part due to near or zero local emissions and quiet operations. Communities are generally more cautious with the installation of hydrogen storage near their community due to the risk of hydrogen seepage and combustion. When located near urban or residential areas, significant stakeholder outreach is often required to garner support for on-site hydrogen storage. With the majority of the SFMTA's yards located in urban regions, adoption of hydrogen may result in community pushback and potential delays in rollout.

2.1.4 San Francisco Municipal Transportation Agency

The SFMTA is a department of the City and County of San Francisco. The SFMTA plans and operates bus, rail, historic streetcar, cable car, and paratransit transit service within the City and County of San Francisco. In addition, the SFMTA also manages parking, traffic, bicycling, walking, and taxis in the city. Prior to the COVID-19 pandemic, the SFMTA provided approximately 726,000 weekday and 220 million annual passenger boardings.[4] 71% of these boardings — 520,000 per weekday and over 156 million annually — occurred on 76 weekday bus routes. Ridership from 654,300 weekday boardings in FY06 to 726,100 in FY16.[5]

Service Area

The SFMTA serves approximately 49 square miles within the City and County of San Francisco (Figure 2-2). San Francisco has added over 78,000 residents and over 175,000 jobs since 2009, and now has a population of 883,000 and 720,000 total jobs.[6]

Utility Provider

The San Francisco Public Utilities Commission (SFPUC) provides electrical service for the SFMTA service area by way of Pacific Gas & Electric (PG&E) electrical infrastructure. The SFPUC operates Hetch Hetchy Power, a Publicly Owned Utility. Although the SFPUC has served all municipal agencies within the City and County of San Francisco for many decades, it relies upon PG&E's transmission and distribution grid to serve its customers, for which PG&E receives a fee.

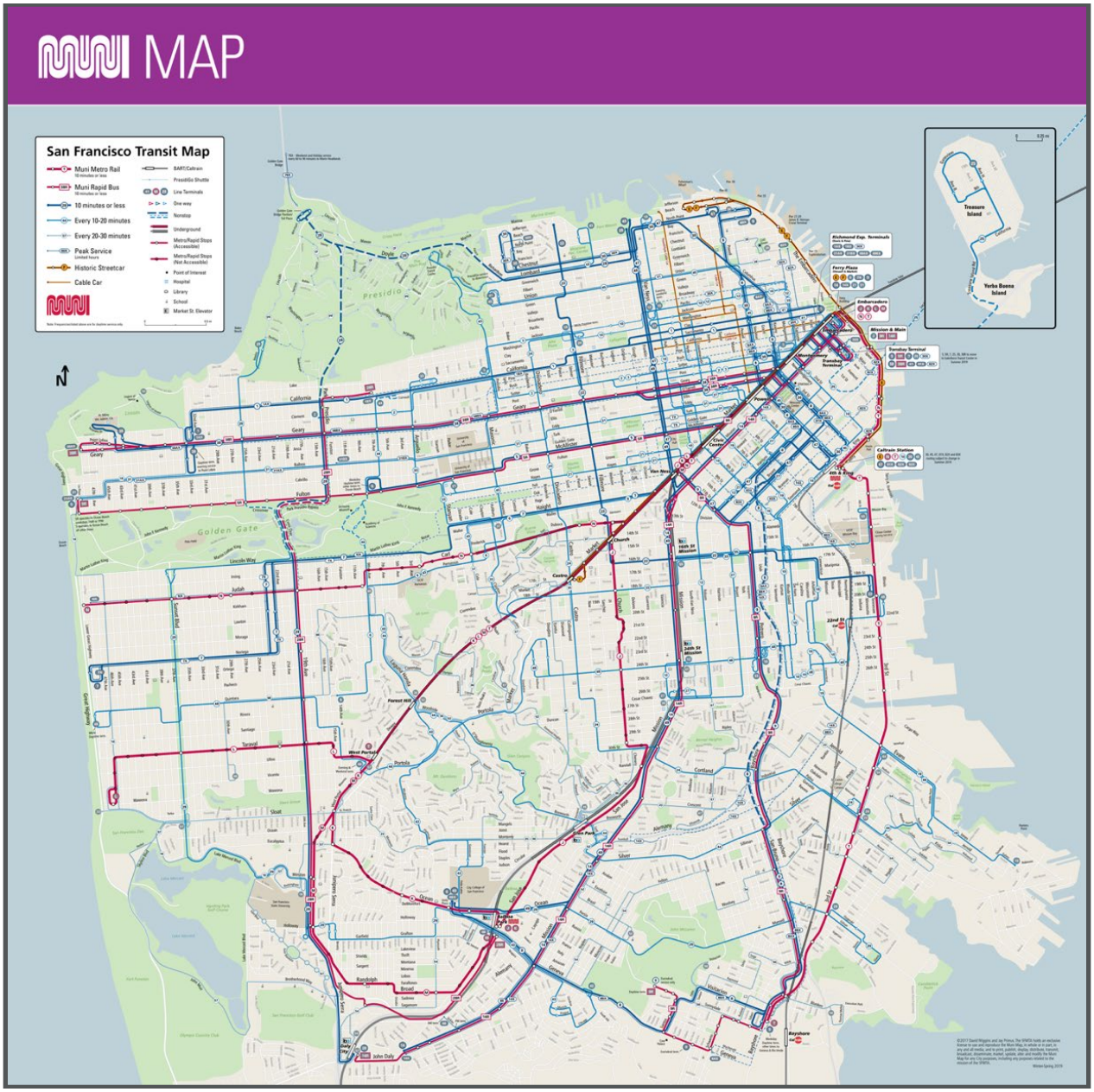
This situation, with the lack of designated service territory boundaries between the two utilities, is unlike any other in the country, and greatly limits the SFPUC's visibility into the detailed grid infrastructure and capacities. Despite multiple requests to gather details, PG&E will not provide information on feeder capacities unless the SFPUC submits an application for service through the Wholesale Distribution Tariff (WDT), a process that may require upwards of $150,000 and two years+ per service location to perform a System Impact Study to determine the capacity available for new loads.

Under the WDT, each SFPUC customer inter-tie point is viewed by PG&E as a utility-to-utility connection. As such, PG&E applies the rules of the WDT to each SFPUC customer connection. This is significant to the SFMTA in several ways, but particularly in terms of project timelines and budget. Each service upgrade that utilizes the PG&E grid must go through PG&E's review process. The SFPUC therefore has no control over processing delays or resource constraints. Upon completion of the review, any grid or infrastructure upgrades required by PG&E are born solely by the SFPUC customer. Being an SFPUC customer, the SFMTA would not be eligible for any betterment cost sharing, like PG&E retail customers

[4] SFMTA Short-Range Transit Plan Fiscal Year 2019 – Fiscal Year 2030, p. 9.
[5] SFMTA Bus Fleet Management Plan 2017-2030, p. 25.
[6] SFMTA San Francisco Mobility Trends Report 2018, Jan 28, 2019, p2.

would, regardless of the quantity of PG&E customers that would benefit from the investment. Similarly, the SFMTA is ineligible for PG&E's EV Fleet programs, which provide funding for grid infrastructure builds and upgrades that support EV charging.

Figure 2-2. SFMTA System Map



Source: SFMTA, Winter/Spring 2019, prior to COVID- 19 induced service suspension

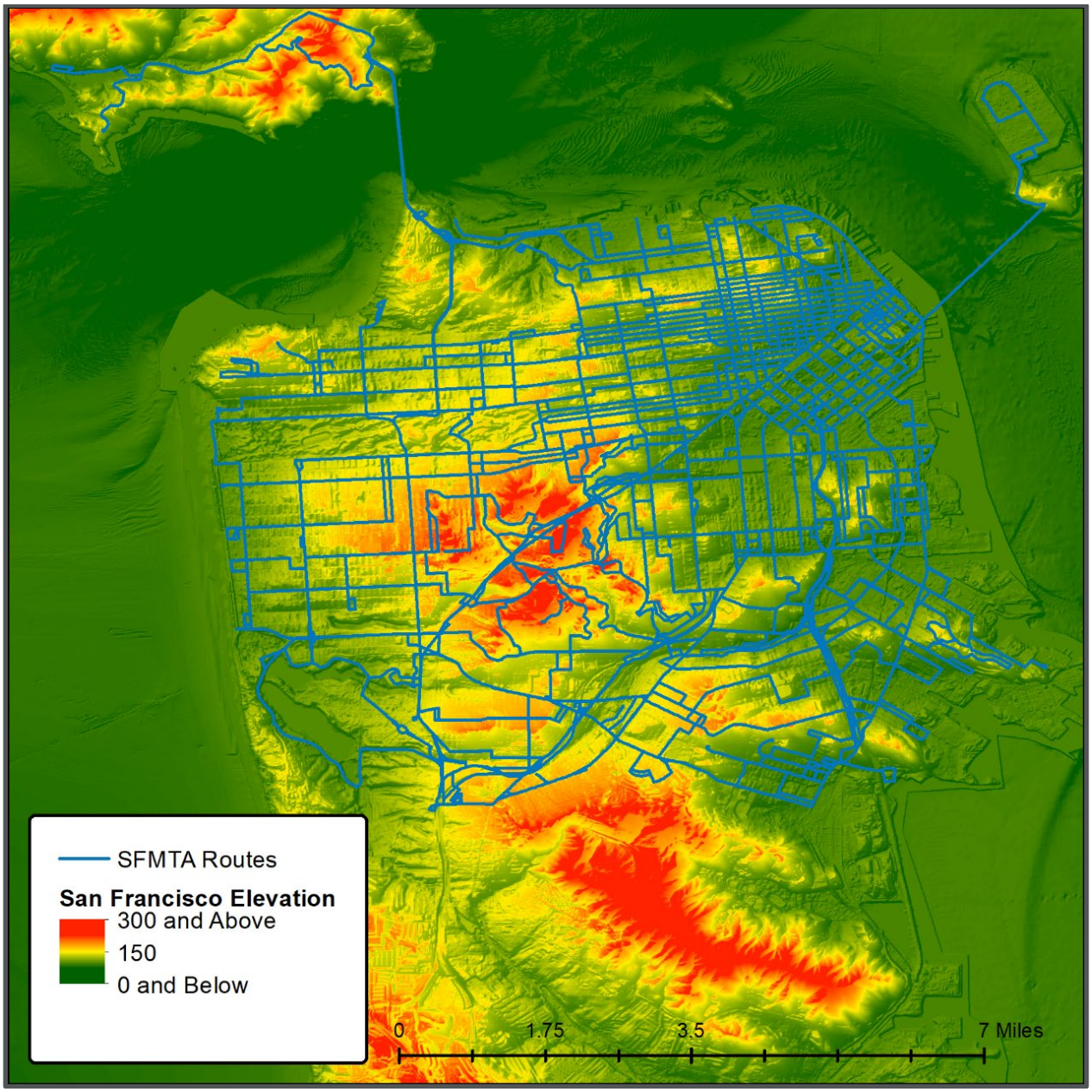
Environmental Factors

San Francisco's Mediterranean climate is characterized by dry summers and wet winters with relatively mild temperatures. Temperature does not vary much throughout the year, with average high temperatures of approximately 70°F during the summer, and average low temperatures of 45°F during the coldest winter days.

Topography is varied, with scores of hills ranging from seal level to over 900 feet in elevation. This varied topography, combined with the effects of cold ocean currents, gives rise to microclimates.

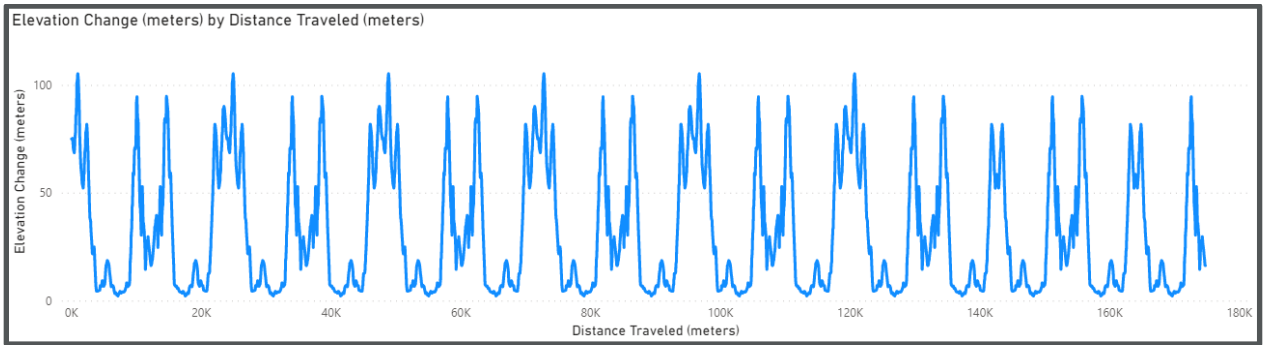
The SFMTA's buses must travel over multiple hills in a day – the steepest grade is 23%. Figure 2-3 shows San Francisco's service and the elevation profile, with much of the service feeding into downtown (which is near sea-level) over numerous hills. An example of the elevation change a transit vehicle may do while in-service is shown in Figure 2-4 with weekday vehicle block 1005 continuously traveling up and down hills for the entirety of its service. The block gains a total of 3,542 meters or 2.2 miles in a day (the equivalent of over 38 football fields or 11.6 times the height of San Francisco's tallest building, the Salesforce Tower, at 1,070 feet).

Figure 2-3. San Francisco Service and Elevation Profile



Source: WSP, USGS DEM

Figure 2-4. Vehicle Block 1005 Elevation Change



Source: WSP, USGS DEM

Schedule and Operations

As of January 2020, the SFMTA directly operates 844 diesel-hybrid and trolley buses on 76 regular weekday routes, which include supplemental Muni Metro Rail Owl service and routes with Rapid and Express service (e.g. Route 14, Route 14R, and Route 14X are three different routes) but excludes weekend-only route 76X and intermittent service to the Chase Center (78X and 79X).[7] These buses are served by six maintenance and storage yards: Flynn, Islais Creek, Kirkland, Potrero, Presidio, and Woods. Bus support functions also occur at 1399 Marin, and the SFMTA is planning bus storage improvements on 4 undeveloped acres east of the Muni Metro East light rail division. The SFMTA's trolley buses operate exclusively out of Potrero and Presidio yards, both of which are over 100 years old.

The SFMTA's fixed-route bus service is organized into six categories or types of service:

1. **Rapid Bus:** Routes that operate every 10 minutes, or more frequently, all day on weekdays and are the focus of transit-priority measures.
2. **Frequent:** Routes that also operate every 10 minutes, or more frequently, all day on weekdays in major corridors, but make more frequent stops than Rapid Bus routes.
3. **Grid:** Routes that form the framework of "trunk" routes across the city (along with Rapid and Frequent bus routes, and Muni SFMTA), with 12-30 minute headways all day on weekdays.
4. **Connector:** Shorter routes that provide coverage (including neighborhood "circulator" service to hillside neighborhoods) that generally operate every 30 minutes all day on weekdays.
5. **Specialized:** Routes with a focused purpose, including: express routes (primarily peak period-only services for commuters); supplemental service (to middle and high schools); and special event service (i.e., sporting events, concerts, etc.). Frequencies on these routes vary.
6. **Owl:** Some routes operate 24 hours a day, while other overnight routes (operating between 1 and 5 a.m.) are comprised of segments of multiple routes.

COVID-19-Related Impacts

As a response to the economic and health impacts of COVID-19, the SFMTA has made major interim service changes, including the closure of Muni Metro and prioritization of core bus routes (per the Muni Core Service Plan).

[7] This is based on January 2020 (pre-COVID) service.

The Muni Core Service Plan (April 2020) prioritizes the most-used routes to provide access to San Francisco's medical facilities while also increasing the volume of buses (to promote social distancing) for riders that are most reliant on transit. As of September 2020, the COVID-19 situation has resulted in a 71% reduction in bus boardings and a 95% reduction in transit revenue compared to the same time in 2019.

The federal government, through the CARES Act, provided some relief to the SFMTA to address the funding shortfall. However, long-term service levels will be contingent on revenues, ridership, and finding creative solutions to deliver that service efficiently and effectively.

COVID-19 directly impacts the SFMTA's transition to a zero-emission fleet due to increased uncertainty of various important factors: future ridership, changes and adaptations to service planning, continued emergency declarations and operations, general economic health or recession, and capital funding.

2.1.5 The SFMTA's Existing ZEB Efforts

The SFMTA is a national leader in confronting climate change and embracing the prospects of a ZE future. The SFMTA has taken multiple steps to not only meet the requirements of CARB's ICT regulation, but also its own ambitious ZE goals, as detailed below.

— The SFMTA currently operates the largest fleet of ZE trolley buses in North America. Trolley buses run on 100% greenhouse gas-free hydropower via an overhead catenary system (OCS). The SFMTA also operates over 600 diesel-hybrid vehicles that run on batteries and renewable diesel.

— In April 2018, in celebration of Earth Day, the then current mayor, Mark Farrell, committed the City of San Francisco to net-zero greenhouse gas emissions by 2050, which would eliminate the city's carbon footprint. The SFMTA is already doing its part and accounts for less than 2% of citywide transportation emissions (45%).

— In partnership with the San Francisco Department of the Environment, the SFPUC, and other city agencies and stakeholders, the SFMTA supported the development of the Electric Mobility Roadmap that lays out a vision for reducing public health and environmental impacts of private transportation. The Roadmap also identifies strategies to help realize an emission-free transportation sector.

— In May 2018, the Board adopted its Zero-Emission Vehicle Policy resolution (ZEV Policy). Under the ZEV Policy, demonstrating the SFMTA's commitment to achieving a 100% zero-emission fleet by 2035.[8]

— In November 2019, the SFMTA procured nine 40-foot BEBs (three each from New Flyer, Proterra, and BYD). These buses will be piloted in regular revenue service to analyze performance and to assist in developing a long-term charging strategy (expected delivery in early 2021).[9] This pilot program includes an electrical and facility upgrade at Woods Yard to accommodate BEB charging equipment and infrastructure.

— In 2018, as part of its Green Zone program, the SFMTA replaced 68 buses with diesel-hybrid buses outfitted with higher capacity batteries and a GPS-enabled switch, which automatically switches the bus to EV mode as it enters geo-fenced areas (Green Zones) throughout the city. In Green Zones,

[8] Due to the impacts of COVID-19 (reduction in ridership, funding, etc.), the SFMTA is revisiting this policy to align it with the ICT regulation (2040).
[9] Nine buses are currently procured with an additional three in negotiations.

the vehicles operate entirely on battery power, reducing and eliminating SFMTA-generated emissions in some of the city's most environmentally burdened communities.

— In February 2020, the SFMTA awarded a contract to WSP to provide a roadmap for the SFMTA's transition to BEB facilities and transit fleet vehicles. This partnership will produce several deliverables that will guide the SFMTA to meet their electrification goals, including a BEB Facility Implementation Master Plan (Master Plan).

— In 2021, the SFMTA procured three 40-foot BEBs from Nova. These buses will be piloted in regular revenue service along with the existing BEBs to analyze performance and to assist in developing a long-term charging strategy (expected delivery in late 2022).

2.2 Rollout Plan Approach

In accordance with the Rollout Plan Guidance, this document provides an overview of several key components to the SFMTA's ZEB transition, including fleet acquisitions, schedule, training, and funding considerations.

Due to the rapidly evolving nature of ZEB technologies, it is likely that the recommended approaches in this Rollout Plan will be adjusted and changed over time. For that reason, the SFMTA will continue to evaluate technologies and strategies throughout the transition process. Areas that are currently under study will be indicated, where applicable. The service-related information in this Rollout Plan is based on January 2020 service (pre-COVID) and the fleet numbers are based on September 2020.

It should also be noted that COVID-19 has caused unprecedented losses in the SFMTA's revenue through the loss of ridership (fares) and the reduction in sales tax revenue. For these reasons, the SFMTA has reduced service and operations and continues to adapt in the near term and forecast the long-term implications on the system and the agency's capital projects and goals. While the impact of COVID-19 on the SFMTA's electrification pursuant to the ICT regulation is still unclear, the SFMTA will continue planning and adjust as needed once COVID-19 is stabilized and trends are more predictable.

2.3 Rollout Plan Structure

In accordance with CARB's Rollout Plan Guidance, the SFMTA's Rollout Plan includes all required elements. The required elements and corresponding sections are detailed below:

— Transit Agency Information (Section 1: Rollout Plan Summary)

— Rollout Plan General Information (Section 1: Rollout Plan Summary)

— Technology Portfolio (Section 2.1.3: ZEB Suitability for the SFMTA's Service and Operations)

— Current Bus Fleet Composition and Future Bus Purchases (Section 3: Fleet and Acquisitions)

— Facilities and Infrastructure Modifications (Section 4: Facilities and Infrastructure Modifications)

— Providing Service in Disadvantaged Communities (Section 5: Equity Considerations)

— Workforce Training (Section 6: Workforce Training)

— Potential Funding Sources (Section 7: Costs and Funding Opportunities)

— Start-up and Scale-up Challenges (Section 8: Start-up and Scale-up Challenges)

3 Fleet and Acquisitions

The following section provides an overview of the SFMTA's existing fleet, planned ZEB technology, and proposed procurement schedule.

3.1 Existing Bus Fleet

The SFMTA bus fleet includes diesel-hybrid (DHEB) and electric trolley buses ranging from 30- to 60-feet. As of September 2020, the SFMTA operates a fleet of 844 buses.

The fleet is served by six bus maintenance and storage yards, two for trolley buses, two for 60-foot buses, and two for standard (30- and 40-foot) buses. Table 3-1 provides a detailed overview of the SFMTA's existing bus fleet.

Table 3-1. Summary of the SFMTA's Existing Bus Fleet

Manufacturer	Series	Fuel Type	Length	In Service Year	Bus Type	Quantity
New Flyer	8601-8662; 8701-8710; 8713-8750	DHEB	40'	2013	Standard	111
	8711			2014		1
	8800-8859; 8861; 8864-8866; 8869; 8871			2016		66
	8751-8780; 8860; 8862-8863; 8867-8868; 8870; 8872-8901			2017		66
	8902-8955			2018		54
	8956-8969			2019		14
	6500-6544; 6546-6553; 6700		60'	2015	Articulated	54
	6545; 6554; 6560-6605l; 6701-6730			2016		78
	6606-6644; 6646-6647; 6649-6650; 6653			2017		44
	6645; 6648; 6651-6652; 6654-6697			2018		48
	5701-5798	Trolley Bus	40'	2018	Standard	98
	5799-5885			2019		87
	7201-7225		60'	2015	Articulated	24
	7224; 7226-7260			2016		36
	7261-7280			2017		20
	7281-7293			2018		13
Orion	8501-8530	DHEB	30'	2007	Standard	30
					Total Buses	**844**

Source: SFMTA, September 2020

3.1.1 Battery-Electric Bus Technologies

The SFMTA intends to transition its DHEBs to BEBs. The SFMTA's future BEBs are expected to be compatible with the Society of Automotive Engineers' (SAE) J1772 (plug-in) and SAE J3105 (pantograph) charging standards. By supporting both standards, the SFMTA's buses will have the flexibility of charging in multiple layouts and orientations. The plug-in standard will allow buses to charge while being serviced, and the pantograph standard will allow buses to charge at the base and at potential on-route charging locations. The roof-mounted charging rails that are associated with the pantograph standard will allow the SFMTA's BEBs to access "fast" high-power charging (in excess of 150 kW) for a limited duration.

Based on the SFMTA's existing service needs and yard configurations, it is recommended that an inverted pantograph-charging strategy be implemented to support BEBs at all six yards. The pantographs will be supported by an overhead frame that covers the surface of the bus parking tracks. The overhead strategy was deemed to be the most suitable due to space constraints at the SFMTA's yards. The overhead frame will also be able to support photovoltaic panels (where applicable) and electrical equipment and components (conduit, etc.). Exceptions to the overhead frame solution could potentially occur in multi-level facilities as they are rebuilt, such as Potrero and Presidio Yards. Future design of those facilities would likely either include an overhead frame or an equipment mezzanine, but the SFMTA will leave those decisions to the facility design teams.

The proposed facility layouts for each yard are based on utilizing a 150-kW DC charging cabinet in a 1:2 charging orientation (one DC charging cabinet energizes two separate dispensers/buses). This charger-to-dispenser ratio maximizes space utility, reduces capital costs, and meets the requirements to charge the fleet during servicing and dwell time on the site while minimizing the peak electrical demand. That said, the SFMTA continues to monitor technological advancements and may explore other strategies that are advantageous to the SFMTA.

Figure 3-1 shows an example of a pantograph and charge rails.

Figure 3-1. Inverted Pantograph and Charge Rails

Source: WSP

3.2 Procurement Schedule

In accordance with the ICT regulation, the SFMTA will prioritize ZEB purchases and progressively increase the percentage of ZEB purchases over time. As planned, starting in 2027, all the SFMTA's new bus purchases will be zero-emission vehicles (BEB and Trolleys) - two years before the ICT regulation requires.

Early retirement should not be an issue pursuant to the ICT regulation (2040) based on the SFMTA's future purchases. However, if early retirement becomes a risk, one potential strategy is to place newly acquired buses on the SFMTA's longest (distance) service blocks. This will ensure that buses meet the Federal Transit Administration's (FTA) 500,000-mile minimal useful life requirement sooner. Prior to implementing such a measure, the SFMTA will conduct an equity analysis to ensure that service distribution and vehicle choice is equitable across neighborhoods and districts.

Table 3-2 summarizes the SFMTA's anticipated procurements through 2040 and Figure 3-2 presents the percentage of the fleet that are powered by zero-emission technologies or fossil fuels through the same timeframe. Table 3-3 summarizes the SFMTA's planned fleet totals through 2040. These are built on the assumption that BEBs and associated battery capacities will be available to meet the SFMTA's service block ranges so that a 1:1 replacement ratio with DHEBs is achievable. It should be noted that this is

contingent on the availability of funding, whether battery technology can meet the SFMTA's range requirements, and whether facilities and utility enhancements are completed. The COVID-19 pandemic has caused uncertainty in the long-term impacts to the SFMTA's funding and service. Staff is actively analyzing these changes and will update the schedule accordingly.

In 2023/4, the SFMTA plans to apply at least 20 "Bonus Credits" and up to 12 BEBs early purchases (SFMTA would have 12 BEBs operating in revenue service during this time) to their procurement to satisfy the 25% ZEB purchase requirement. In the year 2027 and beyond, all new bus purchases will be 100% zero-emission vehicles – two years prior to the ICT regulation's requirements.

Table 3-2. Summary of the SFMTA's Future Bus Deliveries (Through 2040)*

Existing Fleet	32ft MC		40ft MC			40ft TB		60ft MC		60ft TB	Total Procured
Procurement Type	Hybrid Rep.	BEB Rep.	Hybrid Rep.	BEB Rep.	BEB Exp.	Trolley Rep.	BEB Rep.	BEB Rep.	BEB Exp.	Trolley Rep.	
2021					3						3
2022	30				9						39
2023											0
2024				12							12
2025			69						6		75
2026			31								31
2027								48			48
2028				11				79	4		94
2029				45	34			5	26		110
2030				48				42	20		110
2031				28				50		12	90
2032				40					2	48	90
2033				31		21			5	33	90
2034					20	80			10		110
2035		9			20	81					110
2036		21		21	5	3					50
2037				69							69
2038				31				6			37
2039								48			48
2040				11				79			90
Notes	"MC": Motor Coach (Hybrid or Battery Electric Bus), "TB": Trolley Bus, "Exp.": Expansion, "Rep.": Replacement, "BEB": Battery Electric Bus										

Note: The SFMTA's existing DHEBs are expected to be replaced with BEBs 12 years after their in-service date. This procurement schedule assumes a 1:1 replacement ratio with BEBs being replaced every 12 years (mirroring 12-year warranties) and does not incorporate fleet growth projections/additions as these are still currently under study.

*SFMTA expects that the NTP for the buses delivered in the table above would be issued at least 12-18 months in advance.

Figure 3-2. Percentage of Zero-Emission and Fossil Fuel Fleet (2021-2040)

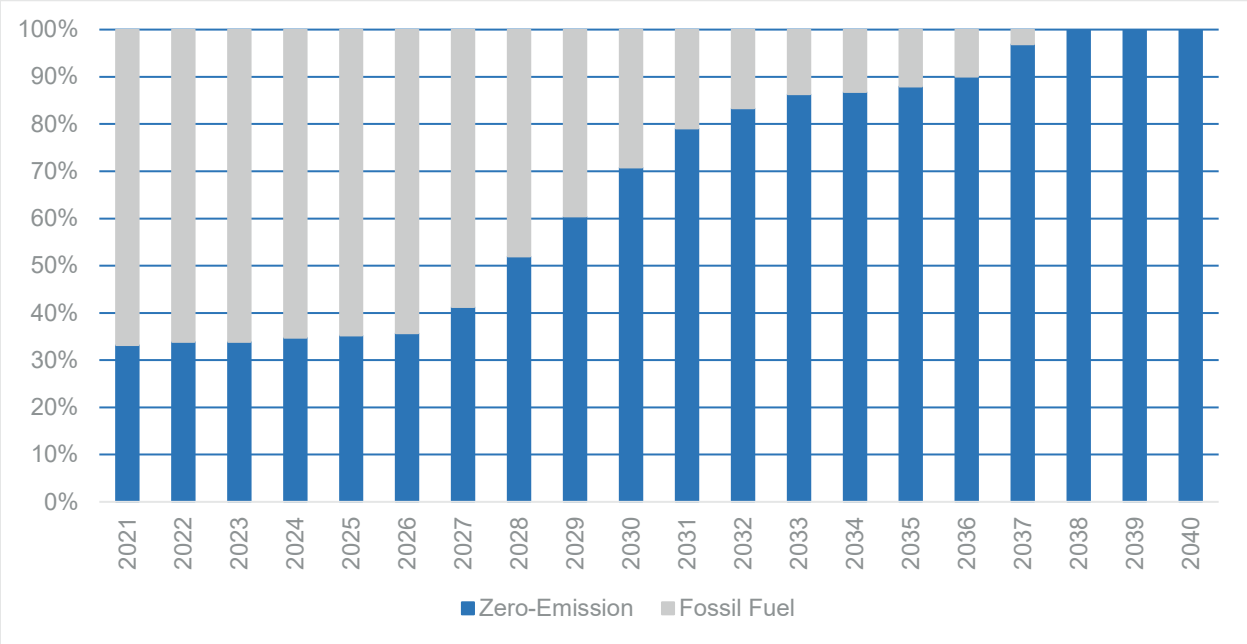


Table 3-3. Total Fleet Size Each Year

	32 DHEB	32 BEB	40 DHEB	40 BEB	40 TB	60 DHEB	60 TB	60 BEB	Total
2021	30	0	312	3	185	224	93	0	847
2022	30	0	312	12	185	224	93	0	856
2023	30	0	312	12	185	224	93	0	856
2024	30	0	312	24	185	224	93	0	868
2025	30	0	312	24	185	224	93	6	874
2026	30	0	300	24	185	224	93	6	862
2027	30	0	300	24	185	176	93	54	862
2028	30	0	289	35	185	97	93	137	866
2029	30	0	244	114	185	92	93	168	926
2030	30	0	196	162	185	50	93	230	946
2031	30	0	168	190	185	0	93	280	946
2032	30	0	128	230	185	0	93	282	948
2033	30	0	100	258	185	0	93	287	953
2034	30	0	100	278	185	0	93	297	983
2035	21	9	100	298	185	0	93	297	1003
2036	0	30	100	303	185	0	93	297	1008
2037	0	30	31	372	185	0	93	297	1008
2038	0	30	0	403	185	0	93	297	1008
2039	0	30	0	403	185	0	93	297	1008
2040	0	30	0	403	185	0	93	297	1008
Notes	“DHEB”: Diesel Hyrbid Electric Buses, “BEB”: Battery Electric Bus, “TB”: Trolley Bus,								

Source: WSP

3.2.1 ZEB Bonus Credits

Based on the ICT regulation, the SFMTA is entitled to 18 bonus credits for their existing trolley buses[10] and will have 12 early purchases available for their planned BEB pilot buses[11], resulting in 30 available credits for the SFMTA. As indicated above, the SFMTA plans to exercise these credits in the 2023/4 procurement. In lieu of the 25% ICT ZEB purchase requirement, the SFMTA will use 28 of their credits (25% of 112 buses).

3.2.2 ZEB Range Requirements and Costs

Approximately 9% of the SFMTA's existing bus blocks travel farther than 150 miles per weekday – a range that exceeds current batteries' capabilities.[12] To reduce impacts to service, there are several strategies that the SFMTA can consider to meet service (range) requirements, including midday charging, battery/charging management systems, on-route chargers, additional bus purchases, and solar and battery storage. In addition, with battery technology rapidly evolving, future battery capacities and efficiencies may be sufficient to serve all blocks..

3.2.3 ZEB Conversions

Conventional bus conversions to ZEB technologies are not currently being considered. However, the SFMTA will remain open to conversions if they are deemed financially feasible and align with ZEB adoption goals.

[10] Per the ICT regulation: "Each electric trolley bus placed in service between January 1, 2018, and December 31, 2019, receives one-tenth of a Bonus Credit that will expire by December 31, 2024."
[11] Nine buses are currently procured with an additional three in negotiations.
[12] This is based on January 2020 (pre-COVID) service.

4 Facilities and Infrastructure Modifications

The following sections provide an overview of the existing fleet (by yard), proposed charging strategies, infrastructure, yard improvements, and program schedule.

4.1 Overview of Existing Facilities

The SFMTA has six yards, all of which will require significant capital improvements to accommodate a 100% zero-emission fleet. Table 4-1 summarizes the number and type of buses that are currently stored at each facility and Figure 4-1 presents the locations of each yard.

Table 4-1. Summary of Existing Yards and Fleets

Yard	Address	Total	Diesel-Hybrid Buses			Trolley Buses	
			30’	40’	60’	40’	60’
Flynn	1940 Harrison St.	119	-	-	119	-	-
Islais Creek	1301 Cesar Chavez St.	115	10	-	105	-	-
Kirkland	2301 Stockton St. and 151 Beach St.	91	-	91	-	-	-
Potrero	2500 Mariposa St.	146	-	-	-	53	93
Presidio	949 Presidio Ave.	132	-	-	-	132	-
Woods	1095 Indiana St.	241	20*	221	-	-	-
	Total	844	30	312	224	185	93

Source: SFMTA Master Fleet Assign Ratio, September 2020

Figure 4-1. The SFMTA's Bus Yards

Source: WSP

4.2 ZEB Facility and Infrastructure Strategy

Since ZEB technology continues to evolve, it is difficult to commit to a costly strategy that may quickly become outdated or obsolete. However, it is also important to ensure that strategies are future-ready. For this reason, the recommended facility and infrastructure modifications are based on what each yard is planned to accommodate in 2040 per the *2017 SFMTA Facilities Framework* report and resulting *Building Progress* capital program. Since service changes and bus movements may occur multiple times a year, by establishing a full-build scenario, the SFMTA can optimize and tailor strategies based on existing (or anticipated) service.

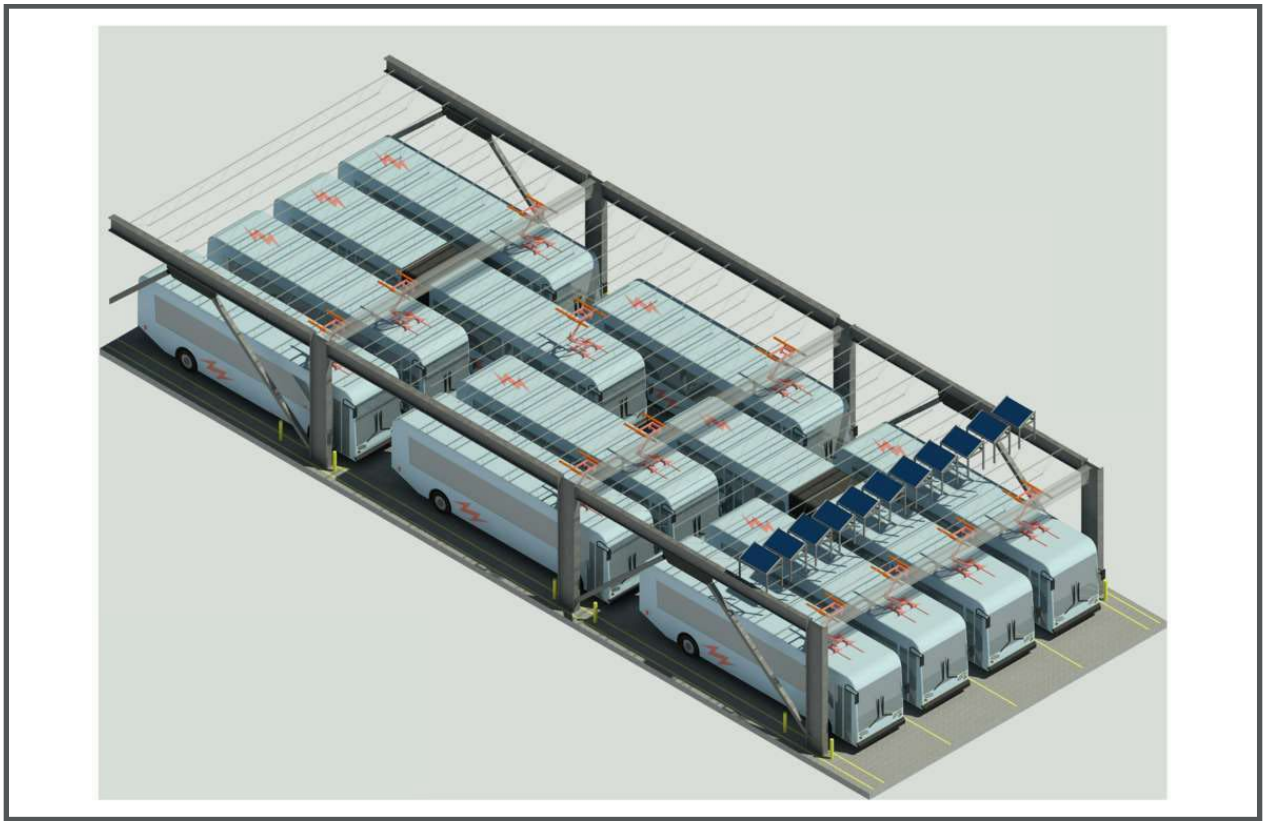
The SFMTA's transition to a zero-emissionfleet will require an increase in the electrical supply to the site, enhancements and expansions of electrical equipment, and the installation of gantries, chargers, dispensers, and other components. These modifications must occur at all six yards. While the SFMTA is not currently actively seeking on-route charging locations, we remain open to the concept, particularly if it is required to meet the service plan.

During preliminary concept discussions, both conductive and inductive charging solutions were considered and analyzed by the SFMTA and the design team. Based on several factors, including the space constraints at each yard and the desire for uniform infrastructure for ongoing maintenance efficiency, the SFMTA committed to an inverted pantograph strategy for all yards. However, where applicable, such as in maintenance areas, plug-in dispensers may be utilized.

To support the inverted pantographs, a scalable and modular overhead support structure is proposed in open bus yards to retain maximum bus parking capacity while implementing BEB charging. This type of overhead structure can be rapidly modified to meet changes in the SFMTA's fleet mix. The system consists of an overhead structure spanning up to four tracks of bus parking with pantographs mounted at various five-foot intervals as required by the assigned bus fleet. Charger cabinets, switchboards, transformers, and all electrical distribution will be kept above the bus parking area, where possible, to avoid costly trenching and reduce service interruptions during the transition.

Figure 4-2 illustrates inverted pantographs mounted to the modular overhead support structure.

Figure 4-2. Inverted Pantographs and Modular Support Structure



Source: WSP
Note: The frame can also support plug-in dispensers.

The proposed layouts are based on utilizing a 150-kW DC charging cabinet in a 1:2 or 1:3 charging orientation (one DC charging cabinet energizes two separate dispensers/buses). This charger-to-dispenser ratio would meet the requirements to charge the SFMTA's fleet overnight and minimize peak electrical demand.

4.3 ZEB Transition

The process of integrating BEBs into the SFMTA's fleet is very complex. Each yard will need to have sufficient power (utility enhancements) and charging infrastructure in place before buses are delivered. While the utility enhancements can generally be done without impacting normal operations, the installation of the support structure and charging equipment (chargers, switchgear, transformer, etc.) could negatively impact operations. For that reason, the planning of distinct on-site construction stages and program-level phasing is essential.

Staging

To avoid service disruptions and operational impacts, the SFMTA's yards will undergo BEB upgrades in several on-site stages. These "stages" are segments of the yard that will be temporarily shut down to install the necessary BEB-supporting infrastructure. The buses that would normally occupy the staging space will be temporarily relocated on-site (if space allows) or to a neighboring yard or facility. This approach will ensure that construction and normal operations can proceed concurrently. This construction method avoids the complete shutdown of the yard undergoing improvements, which reduces the risks of service impacts.

The number of stages and number of buses that need to be temporarily relocated during each stage vary based on a yard's layout, existing fleet, and additional capacity.

Phasing

In order to electrify the fleet by 2040, it will be necessary to have multiple yards undergoing construction, concurrently. "Phases" are essentially classifications of when and how these yards are grouped. Typically, the phase in which a yard is transitioned is based on agency's priorities or technical feasibility. The SFMTA is also concurrently implementing a facility capital rebuild program. When conceived in 2017, the *Building Progress Program* proposed rebuilds of the SFMTA's three oldest and most obsolete facilities: Potrero Yard, Presidio Yard, and Kirkland Yard. The *Building Progress Program* must be adapted to accommodate zero-emission vehicle infrastructure projects.

The number of phases, stages, and details on bus relocations are currently being analyzed and will be finalized in the SFMTA's ongoing Feasibility and Fleet Transition Plan Study.

Figure 4-3 presents a concept of Islais Creek Yard and how its construction can be staged.

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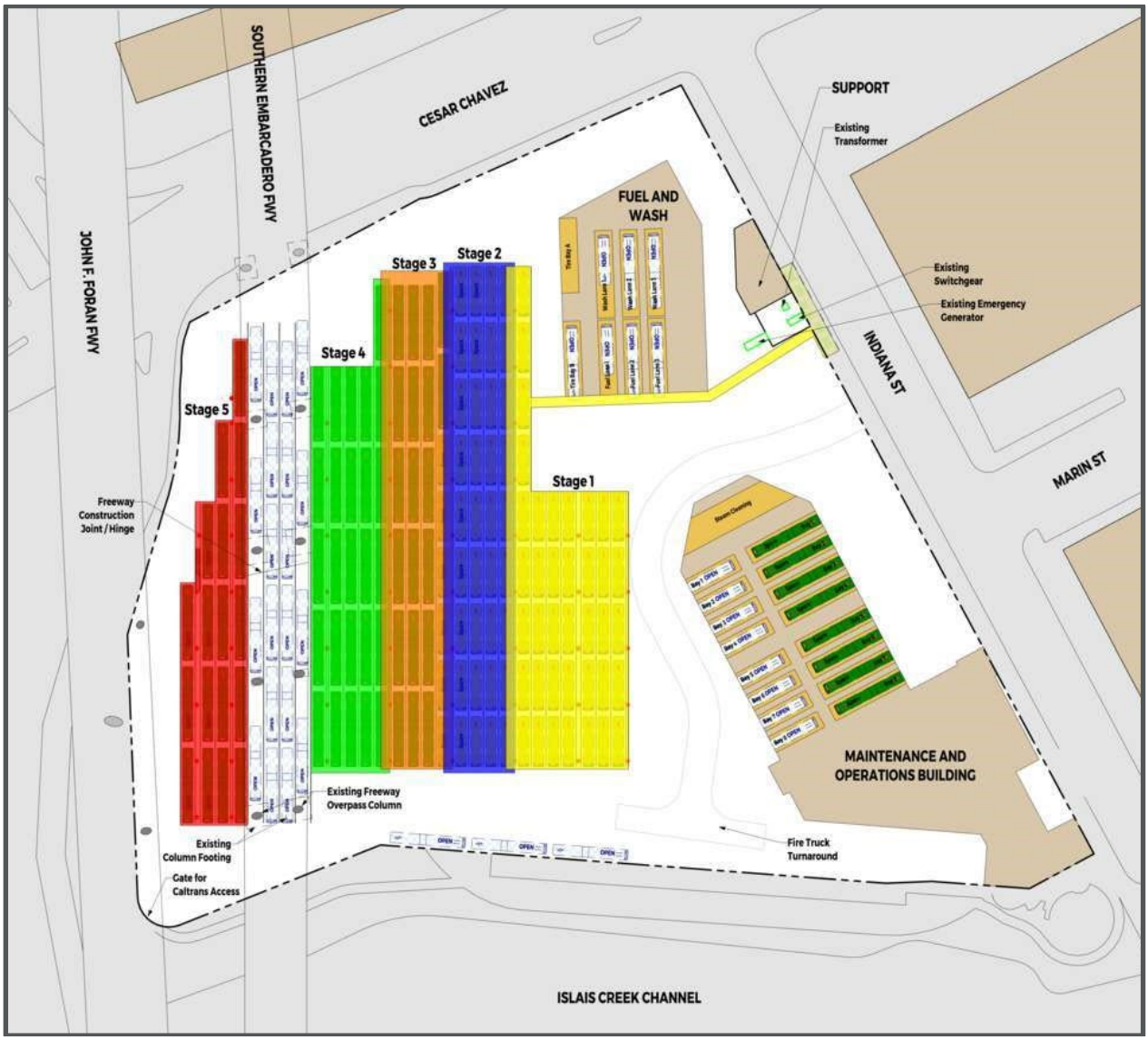
Figure 4-3. SFMTA Staging Example



Source: WSP

4.4 Transition Considerations

There are multiple factors and timetables that must be considered to meet the SFMTA's zero-emission fleet goals in accordance with the ICT regulation. Since BEBs are not operational unless the facilities are in place to energize them, it is essential to meet deadlines because it can impact both service and ICT regulation compliance.

The following provides a brief overview of the various processes and timetable assumptions for each, Figure 4-4 presents the proposed schedule for the SFMTA's zero-emission fleet conversion.

Bid Documents

The electrification process will require multiple subject matter experts, planners, designers, architects, engineers, OEMs, and contractors. For this reason, multiple requests for proposals (RFPs) will need to be developed and put out for bid for various phases of the project. For example, there may need to be an

RFP for a firm to take the project from 30% design to 100% design. There may also be a separate RFP for the construction component. This assumes a typical design-bid-build concept. For more complex rebuild projects, like Potrero and Presidio Yards, the projects will be delivered in a joint development progressive design-build or design-build model. The SFMTA will continue to evaluate the best strategy to meet goals. If a design-bid-build strategy were to be implemented, it is assumed that each stage of bidding would take six months.

BEB-Supporting Enhancements

With the amount of time it will take to construct the pantograph-supporting structures and other BEB enhancements, it is assumed that each "stage" of construction at a yard will take approximately six months to be completed. For example, a yard with three distinct stages would take approximately 18 months to be BEB-ready.

Utility Infrastructure Enhancements

Even with BEBs and BEB-supporting equipment in place, the fleet can only operate if the electrical utility and supporting circuits can meet the energy and power demands of the BEBs. In the SFMTA's case, power is provided by PG&E by way of SFPUC. The SFMTA must undergo a lengthy and uncertain process to request and receive additional power. This process includes an application, a study, permitting, planning and design, and construction (on behalf of SFPUC). This process could take as long as five years. The utility enhancements dictate when a yard is deemed fully operational for BEBs.

BEB Bus Procurements

It is assumed that buses can be procured 18 months before the conclusion of the BEB-supporting enhancements. Typically, ordering buses is not an arduous endeavor. However, the procurements will have to be aligned with the construction of charging equipment at the yard and utility enhancements.

Environmental Clearance

Yards that are scheduled to be demolished and rebuilt, such as Potrero and Presidio, are considered "projects" under the California Environmental Quality Act (CEQA) and an environmental impact report (EIR) will need to be prepared. The process of developing and certifying an EIR can take 2-3 years, pre-construction. The other four divisions may be exempt from developing an EIR pursuant to California's Senate Bill 288, if all requirements, including workforce and labor provisions, of the exemption can be met. The exemption, in part, grants extensions to "transit agency projects to construct or maintain infrastructure to charge or refuel zero-emission transit buses," However, the specific details and guidelines for the exemptions will be further evaluated in subsequent stages of planning.

Temporary Relocations

The SFMTA's 1399 Marin and Muni Metro East (MME) facilities have been identified as sites that can temporarily store and dispatch buses during construction at other sites. For instance, when Potrero and Presidio are being reconstructed, the SFMTA is planning to temporarily relocate their trolley bus fleets there. Procurement tables and construction schedules will have to be in alignment with the timing of these temporarily relocations to avoid scheduling delays or impacts to operations or service.

Yard Management and Operations

The layout and operations of the yard will be vastly different during and after construction. Currently, there are no range issues with the SFMTA's buses and the time it takes to fuel buses is negligible. However, with the transition from DHEBs to BEBs, more considerations to how buses are parked, operated, and

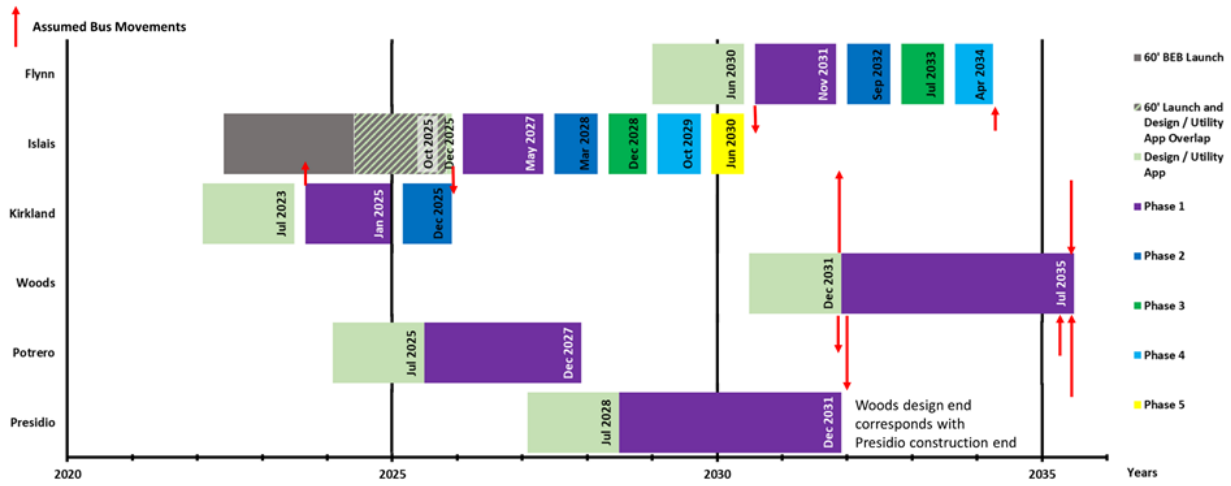
dispatched will be required due to the reduction in range and relatively long charge times. These issues will be even more important during the time(s) that yards are operating mixed fleets (BEB, TB, and DHEB). To mitigate any negative impacts to operations, significant planning and updates to standard operating procedures will be needed to achieve a successful transition.

Schedule

As indicated above, there are multiple prevailing factors that will dictate the SFMTA's transition schedule. Figure 4-4 illustrates a conceptual schedule that can meet ICT regulation goals. This schedule largely follows the priorities of the *2017 Facilities Framework* report and uses the utility provider's conservative five-year estimate as the span of time it will take to enhance all facilities. This schedule does not consider the specifics of bus procurement quantities, service planning, or phasing and is highly contingent on the SFMTA's funding and PG&E and SFPUC's ability to meet construction deadlines.

It should also be noted that the SFMTA is currently evaluating the cost effectiveness of implementing the BEB transition at two facilities that are generally in poor condition (Kirkland and Woods). The capital investment of BEB conversion is significant, and the SFMTA is committed to fiscally responsible capital projects that meet the larger needs of the SFMTA's service and workforce. All of these factors will have impacts to the conceptual schedule.

Figure 4-4. Conceptual Schedule



Source: WSP

4.5 Summary of Yard Enhancements

By 2040, all of the SFMTA's yards will be capable of operating a 100% zero-emission fleet. Table 4-2 summarizes the modifications and schedule of each yard, and the following sections detail the process of each yard's transition from existing conditions to zero-emission vehicle-readiness. The facility narrative is listed in alphabetical order.

Table 4-2. SFMTA ZEB Yard Summary

Yard	Address	Main Functions	Planned Infrastructure	Existing Capacity (2020)	Designated Charging Positions (2035)	Upgrades Req'd?	Timeline
Flynn	1940 Harrison St.	Storage/ O&M	Inverted Pantograph	119	107	Yes	2029-2034
Islais Creek	1301 Cesar Chavez St.	Storage/ O&M	Inverted Pantograph	132	117	Yes	2024-2030
Kirkland	2301 Stockton St. and 151 Beach St.	Storage/ O&M	Inverted Pantograph	95 (Day) 116 (Night)	91	Yes	2022-2025
Potrero	2500 Mariposa St.	Storage/ O&M	Inverted Pantograph	146	216	Yes	2024-2027
Presidio	949 Presidio Ave.	Storage/ O&M	Inverted Pantograph	132	227	Yes	2027-2031
Woods	1095 Indiana St.	Storage/ O&M	Inverted Pantograph	209	250	Yes	2030-2035

Source: WSP
Note: Potrero and Presidio will be fully rebuilt; the scope of the projects includes more than BEB enhancements. Woods will likely also be fully rebuilt.

4.5.1 Flynn Yard

Existing Conditions

Flynn Yard is located at 1940 Harrison Street in the City of San Francisco.

Currently, 119 60-foot diesel-hybrid buses are stored, maintained, fueled, and serviced at Flynn Yard. The yard includes a maintenance area with drive-through bays, transportation area, stand-alone wash canopy, and a stand-alone fuel canopy. All of these facilities are integrated into the lone, single-story building on the site. A tire shop is located separately from the main facility in a building across Harrison Street. The southeast corner of the main Flynn Yard has a cutout that houses separate businesses not related to or owned by the SFMTA. Electrical utility service is provided by the SFPUC.

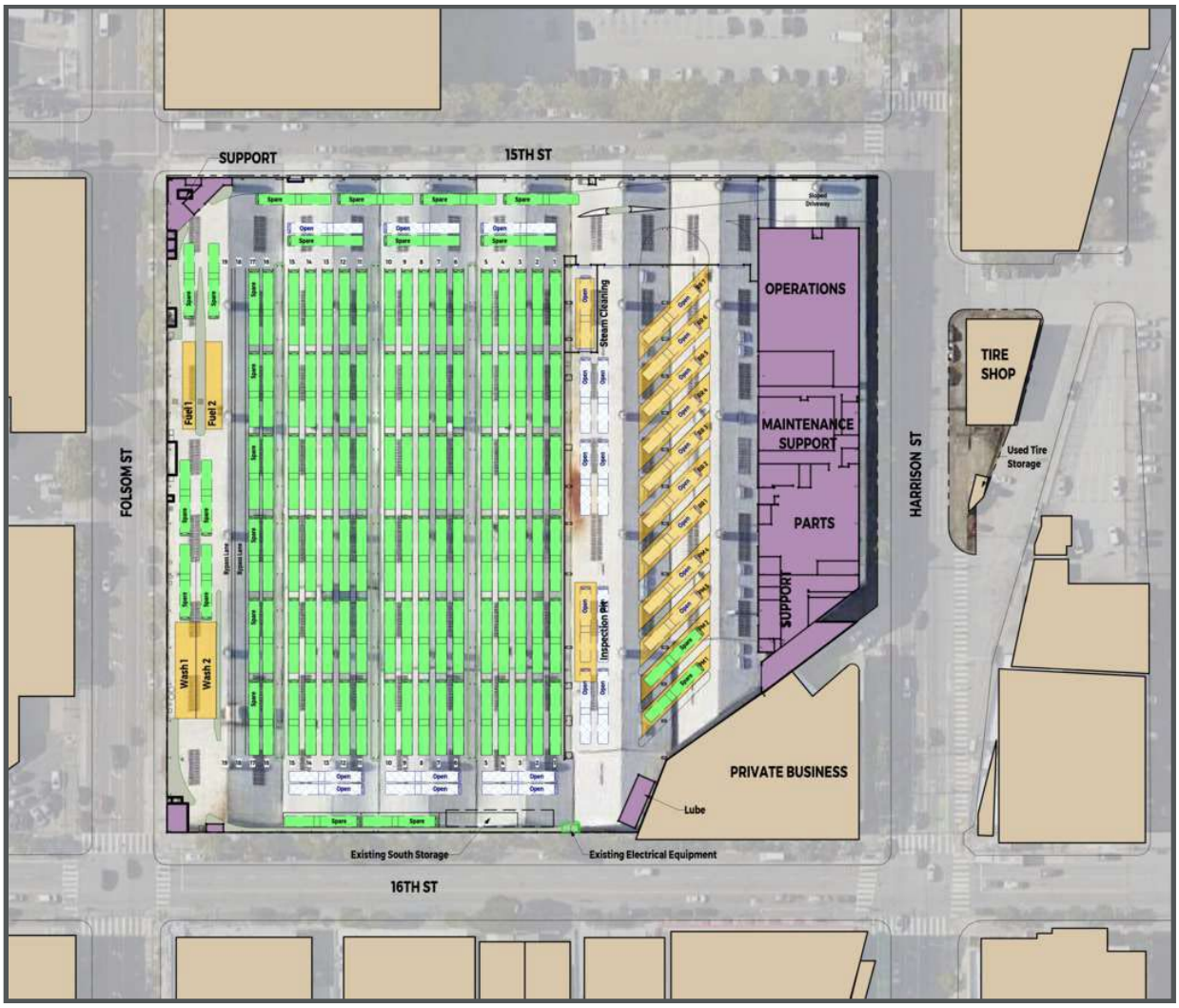
After revenue service, buses enter the yard from Harrison Street and are parked in unassigned, stacked (nose-to-tail) storage tracks in the northern circulation area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lanes. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. Non-revenue vehicles (NRVs) are parked in a row of spaces near the transportation area adjacent to the bus circulation's northernmost lane.

An aerial and site plan of Flynn Yard are presented in Figure 4-5 and Figure 4-6, respectively.

Figure 4-5. Flynn Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-6. Flynn Yard - Existing Conditions (Site Plan)



Source: WSP

Planned ZEB Modifications

The Flynn Yard will be capable of storing and charging 109 total BEBs. 107 buses can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional two buses can be charged in the maintenance bays via plug-in dispensers.

Table 4-3 summarizes the ZEB infrastructure planned at Flynn Yard.

Table 4-3. Flynn Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	119
No. of BEBs Supported (2040)	109
No. of Charging Cabinets	56
No. of Dispensers/Charging Positions	109

Source: WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio)

The following BEB equipment and locations are proposed:

— 56 DC charging cabinets located on a platform attached to the overhead support structure. 55 of these charging cabinets will distribute to 107 pantograph-charging positions over the existing storage tracks and satellite spaces. An additional charging cabinet will power two dispensers installed in the maintenance bays.

— The support structure columns are to be placed every two to three tracks. These columns will also provide the support for the overhead mounted pantographs.

The charging cabinets will be served by the following electrical infrastructure:

— Two interrupter switches and a meter to be installed on the southern exterior of the building along 16th Street. The first interrupter will be owned and operated by PG&E, and the second interrupter and meter will be owned by SFPUC. Power will be distributed from the meter up along and through the building exterior to the medium-voltage switchgear.

— One medium-voltage switchgear and three medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the proposed platforms.

Figure 4-7 illustrates the Flynn Yard at full build-out.

Figure 4-7. Flynn Yard - Full ZEB Build-Out

Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Flynn Yard would include the installation of two new interrupter switches on the exterior of the facility along 16th Street, routing the utility-provided power into the facility to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the easternmost four tracks of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule.

4.5.2 Islais Creek Yard

Existing Conditions

Islais Creek Yard is located at 1301 Cesar Chavez Street in the City of San Francisco.

Currently, 115 diesel-hybrid buses (10 30-foot and 105 60-foot) are stored, maintained, fueled, and serviced at Islais Creek Yard. The yard includes the following separate structures and major site areas: a two-story maintenance building, two-story transportation building, and a combined fuel, wash, and tire repair building. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Indiana Street and are parked in numbered, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lanes. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked throughout the site on facility exteriors and the yard perimeter.

Interstate 280 (I-280) traverses over the western side of the site with support columns located in the bus parking yard. Caltrans owns the property under I-280, which the SFMTA leases for bus parking. Due to Caltrans' I-280 maintenance requirements of the support columns and freeway, the SFMTA's ability to construct in this area of the yard may be significantly restricted. Any proposed BEB or other construction under I-280 need to be reviewed and approved by Caltrans.

An aerial and site plan of Islais Creek Yard are presented in Figure 4-8 and Figure 4-9, respectively.

Figure 4-8. Islais Creek Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-9. Islais Creek Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

The Islais Creek Yard will be capable of storing 153 total BEBs, of which, 149 can be charged (simultaneously). 145 buses can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional four buses can be charged in the maintenance bays via plug-in dispensers. As previously mentioned, Caltrans has an existing easement that may preclude or limit BEB infrastructure. The final determination of what can be built within this easement will be evaluated in future analyses.

Table 4-4 summarizes the ZEB infrastructure planned at Islais Creek Yard.

Table 4-4. Islais Creek Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	115
No. of BEBs Supported (2040)	153
No. of Charging Cabinets	75
No. of Dispensers/Charging Positions	149

Source : WSP
Notes: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).
Any proposed BEB or other construction under I-280 needs to be reviewed and approved by Caltrans.

The following BEB equipment and locations are proposed:

— 73 DC charging cabinets located on a platform attached to the overhead support structure spanning a portion of the bus storage tracks and terminating at the edge of the overhead I-280 offset limits.[13] These charging cabinets will distribute to 145 pantograph-charging positions over the existing main storage tracks with a gap in charging positions under I-280 for storing spare buses. The charging positions begin again in the parking area west of I-280's offset limits.

— The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

— Two charging cabinets and four dispensers located in the maintenance building (with four dispensers) will charge the eight remaining spare buses that cannot be charged in the main parking area.

The pantographs and charging cabinets will be served by the following electrical infrastructure:

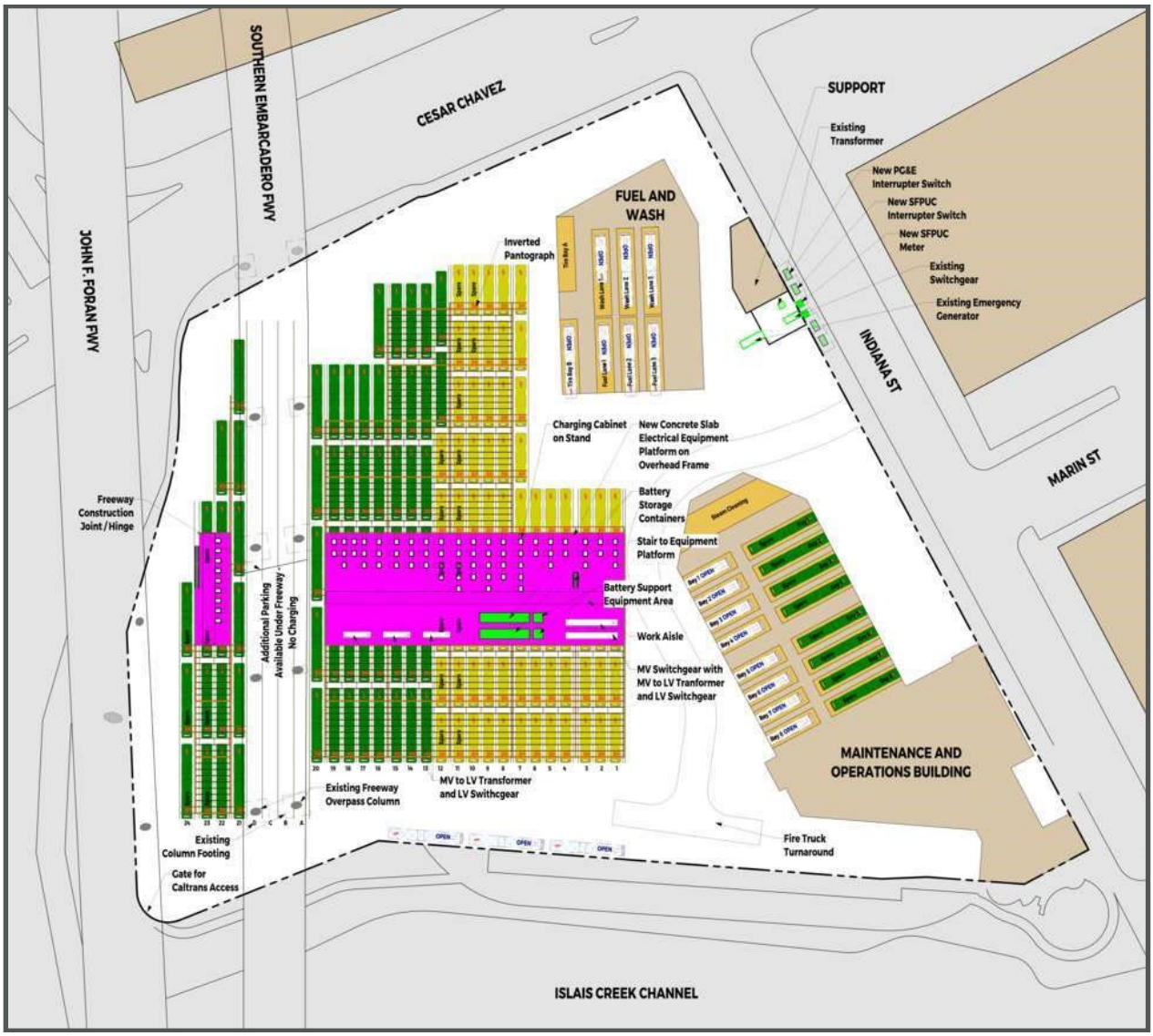
— Two interrupter switch pairs and two meters will be installed in the existing electrical yard. The first interrupter in each pair will be owned and operated by PG&E, and the second interrupter in each pair and both meters will be owned by SFPUC. Power will be distributed from the meter up along the fuel and wash building before crossing to the platform to the medium-voltage switchgear.

— Two medium-voltage switchgears and five medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the platform, above the bus parking area. The switchgear and transformers will be rated for exterior use.

Figure 4-10 illustrates the Islais Creek Yard at full build-out.

[13] Any proposed BEB or other construction under I-280 needs to be reviewed and approved by Caltrans.

Figure 4-10. Islais Creek Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Islais Creek Yard involves the installation of the four interrupter switches and two meters in the existing electrical yard and the routing of utility-provided power into the facility to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the easternmost seven tracks of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule

4.5.3 Kirkland Yard

Existing Conditions

Kirkland Yard is located at 2301 Stockton Street and 151 Beach Street in the City of San Francisco.

Currently, 91 standard diesel-hybrid buses are stored, maintained, fueled, and serviced at Kirkland Yard. The yard includes the following separate structures and major site areas: a maintenance canopy, one-story maintenance support building, one-story transportation building, wash lane (centered in the yard), stand-alone fuel building, and fuel storage yard with support equipment. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Stockton Street and are parked in unassigned, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lane, Track 9, if being washed (not all buses are washed due to site restrictions). After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked in a row of spaces along the northern site perimeter, where possible.

The *Building Progress Program* envisions a full rebuild of Kirkland Yard following completion of Presidio Yard (estimated 2029-2030). However, due to the operational necessity of Woods Yard and the high capital cost of converting to BEB at Woods, the SFMTA is now prioritizing the rebuild of Woods Yard in advance of Kirkland Yard. This means that Kirkland would be upgraded to BEB in its existing configuration as an interim improvement before a full buildout of the site closer to 2040.

An aerial and site plan of Kirkland Yard are presented in Figure 4-11 and Figure 4-12, respectively.

Figure 4-11. Kirkland Yard - Existing Conditions (Aerial)

Source: Google Earth

Figure 4-12. Kirkland Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

The Kirkland Yard will be capable of storing 81 total BEBs, of which, 77 can be charged (simultaneously). 72 can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional five buses can be charged in the maintenance bays via plug-in dispensers. To meet the 2040 conversion timelines, this would be an interim improvement for approximately 10-15 years. Then, the Kirkland Yard would need to be fully rebuilt around 2040.

Table 4-5 summarizes the ZEB infrastructure planned at Kirkland Yard.

Table 4-5. Kirkland Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	91
No. of BEBs Supported (2040)	81
No. of Charging Cabinets	39
No. of Dispensers/Charging Positions	77

Source : WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

The following BEB equipment and locations are proposed:

— 36 DC charging cabinets located on a platform attached to the overhead support structure spanning the northwest quadrant of the parking area. These charging cabinets will distribute to 72 pantograph-charging positions mounted from overhead support structures over the bus parking tracks.

— The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

— Three charging cabinets installed on a mezzanine located inside the new maintenance building adjacent to or near the electrical room. These charging cabinets will be connected to five dispensers installed between every two bays. This will provide charging for the nine buses that cannot be charged in the main parking area.

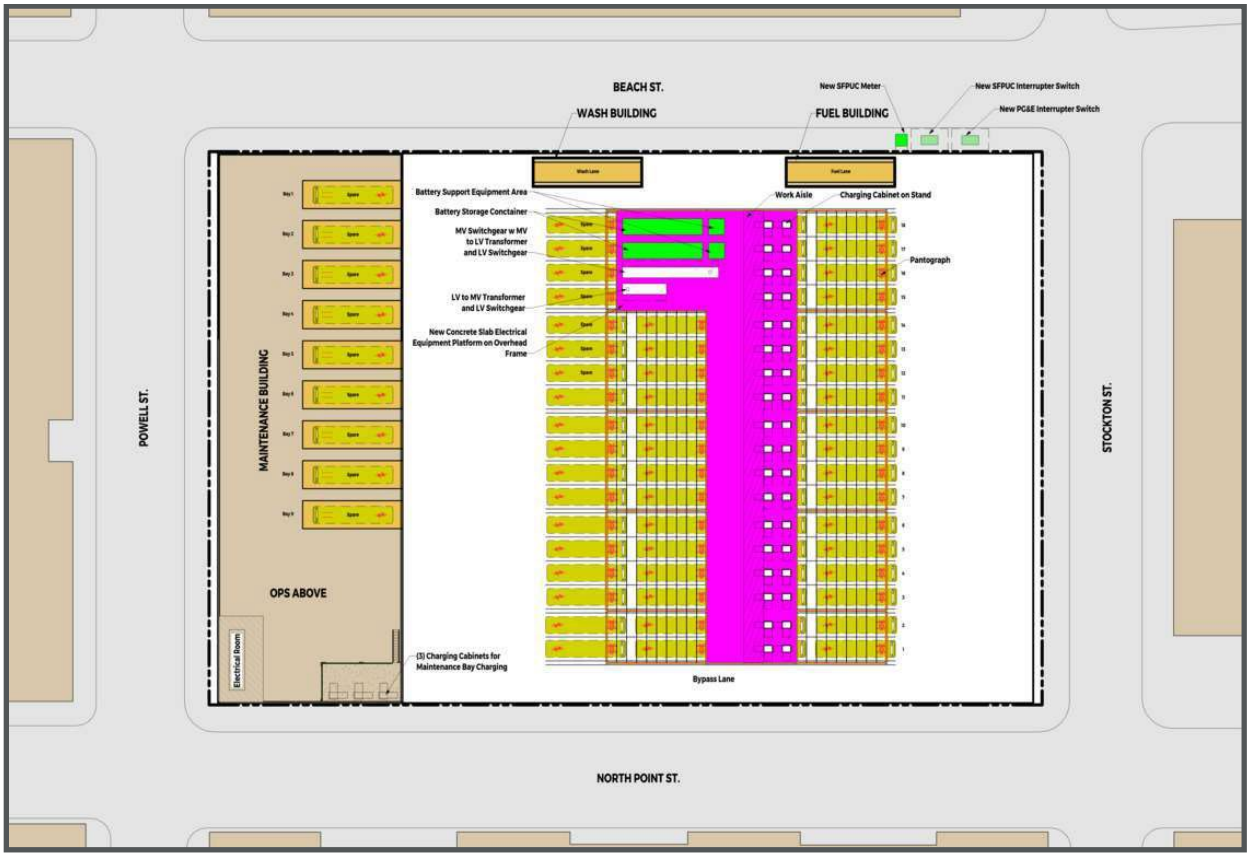
The pantographs and charging cabinets will be served by the following electrical infrastructure:

— One pair of interrupter switches and a meter will be installed on the northeast side of the site along Beach Street. The first interrupter will be owned and operated by PG&E, and the second interrupter and meter will be owned by SFPUC. Power will be routed up along the new fuel lane and across to the platform to feed the new medium-voltage switchgear.

— One medium-voltage switchgear and two medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the platform, above the bus parking area. The switchgear and transformers will be rated for exterior use.

Figure 4-13 illustrates a conceptual rebuild of Kirkland Yard with associated ZEB improvements.

Figure 4-13. Kirkland Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

Kirkland Yard was expected to be fully demolished and redeveloped prior to implementing BEBs on the site. However, due to financial and schedule issues, the SFMTA is developing an interim improvement at Kirkland that may include BEB infrastructure and several smaller facility improvement projects.

4.5.4 Potrero Yard

Existing Conditions

Potrero Yard is located at 2500 Mariposa Street in the City of San Francisco.

Currently, 146 trolley buses (53 40-foot and 93 60-foot) are stored, maintained, fueled, and serviced at Potrero Yard. The yard includes the following separate structures and major site areas: a two-story combined maintenance and transportation building, separate tire shop and body building, wash area, carbon-check area, and two separate bus parking yards. The upper yard and body/tire building are located on the deck above the maintenance building which is accessible from the north via 17th Street. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Mariposa Street and are parked in unassigned, stacked (nose-to-tail) storage tracks in front of the carbon check area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to have their carbon checked, fare retrieved, interior cleaned, and fueled before pulling forward to the bus wash area. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked along the western site perimeter.

Potrero Yard is over 100 years old and anticipated to be demolished and rebuilt with modern bus facilities and potential residential element per the Potrero Yard Modernization Project. The expected in-service date for the new building is end of 2026.

Figure 4-14 presents Potrero Yard under existing conditions.

Figure 4-14. Potrero Yard - Existing Conditions (Aerial)

Source: Google Earth

Planned ZEB Modifications

As previously mentioned, the Potrero Yard Modernization Project aims to rebuild and expand the 4.4-acre site. The goal of the project is to replace the obsolete two-story maintenance building and bus yard with a modern, three-story, efficient bus maintenance and storage garage, equipped to serve the SFMTA's grown fleet as it transitions to zero-emission fleet.

As of February 2021, the Project is about to enter the Request for Proposals phase, during which zero-emission vehicle modifications will be defined. As the future yard will to be multi-level, the Potrero Yard design guidelines include an overhead structure-mounted inverted pantograph-charging solution. Depending on the design choices made by the future Potrero Yard design team, the required electrical infrastructure could be installed in multiple configurations to suit the final design of the facility. Table 4-6 summarizes the zero-emission vehicle infrastructure proposed at Potrero Yard.

Table 4-6. Potrero Yard Zero-Emission Vehicle Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	146
No. of BEBs Supported (2027)	85

Source: WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio)

Phasing and Construction Strategy

Since Potrero Yard will be fully redeveloped prior to implementing BEBs on the site, it is recommended that the entire infrastructure and charging position deployment be included in the redevelopment project. This will allow the BEBs transition to occur concurrently to the planned redevelopment construction process and avoid any further operational interruptions.

4.5.5 Presidio Yard

Existing Conditions

Presidio Yard is located at 949 Presidio Avenue in the City of San Francisco.

Currently, 132 40-foot trolley buses are stored, maintained, fueled, and serviced at Presidio Yard. The yard includes the following separate structures and major site areas: a two-story combined maintenance and transportation building, wash area, carbon check area, and bus parking yard. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Presidio Avenue and are parked in unassigned, stacked (nose-to-tail) storage tracks in front of the carbon check area. Individual buses are then pulled from the storage tracks and taken by nightly service staff to have their carbon checked, fare retrieved, interior cleaned, and fueled before pulling forward to the bus wash area. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked along the northern site perimeter.

Presidio Yard is over 100 years old and anticipated to be demolished and rebuilt with modern bus facilities. The Presidio Yard Modernization Project began pre-development and planning in early 2020. The expected in-service date for the new building is end of 2029.

Figure 4-15 presents Presidio Yard under existing conditions.

Figure 4-15. Presidio Yard - Existing Conditions (Aerial)

Source: Google Earth

Planned Zero-Emission Vehicle Modifications

Similar to Potrero Yard, Presidio Yard is planned to be fully redeveloped.

Although the design for the redevelopment project and specific zero-emission vehicle modifications are still being evaluated, it is recommended that the Presidio Yard adopt an overhead structure-mounted inverted pantograph-charging solution. Depending on the design choices and criteria developed by the SFMTA and the future Presidio Yard design team, the required electrical infrastructure could be installed in multiple configurations to suit the final design of the facility.

Table 4-7 summarizes the zero-emission vehicle infrastructure planned at Presidio Yard.

Table 4-7. Presidio Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	132
No. of BEBs Supported (2031)	85

Source : WSP
Note : It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

Phasing and Construction Strategy

Since Presidio Yard is expected to be redeveloped prior to implementing BEBs on the site, it is recommended that the entire infrastructure and charging position deployment be included in the redevelopment project. This will allow the BEB transition to occur concurrently to the planned redevelopment construction process and avoid any further operational interruptions.

4.5.6 Woods Yard

Existing Conditions

Woods Yard is located at 1095 Indiana Street in the City of San Francisco.

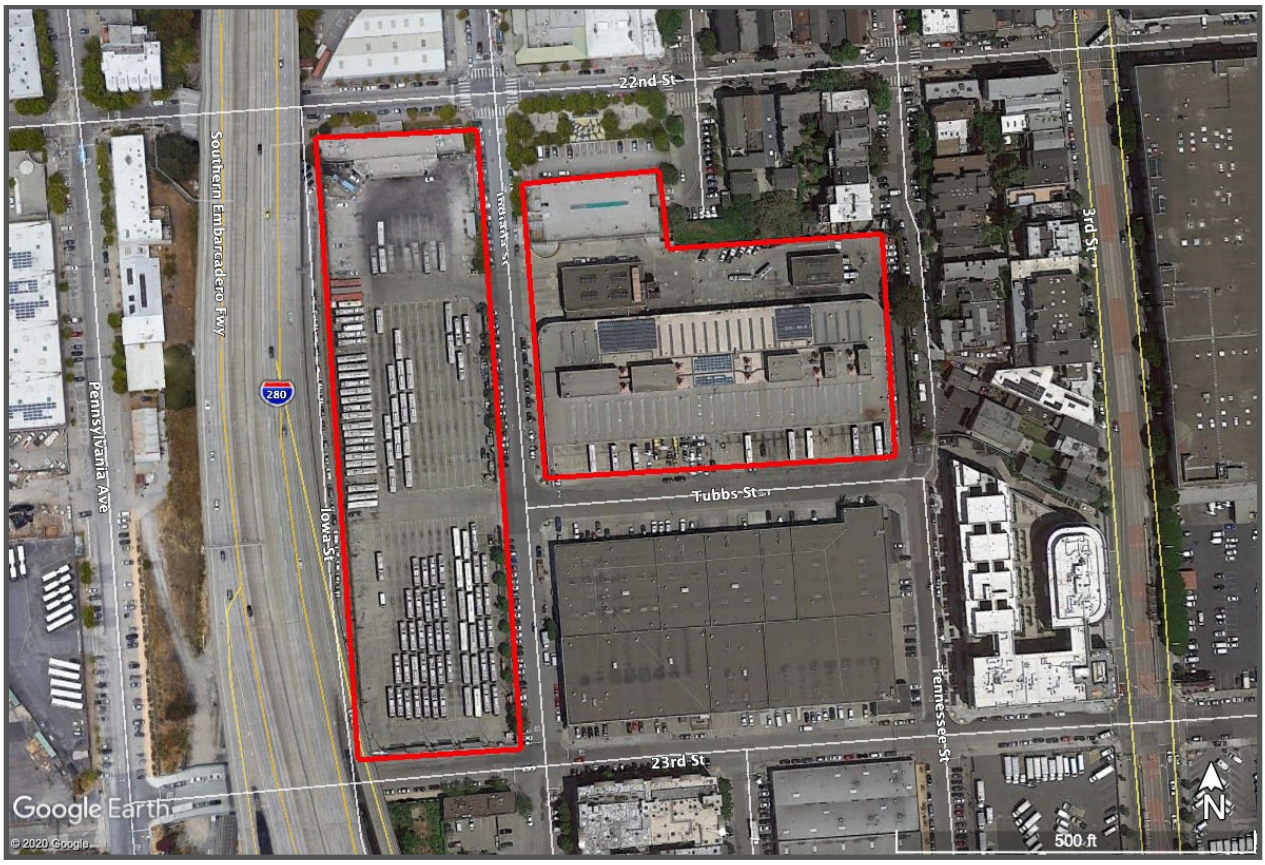
Currently, 221 (221 40-foot and 20 30-foot) diesel-hybrid buses are stored, maintained, fueled, and serviced at Kirkland Yard. The 20 30-foot buses are exclusively used for training purposes. Woods has the largest bus capacity in Muni's system and is of strategic importance in the overall Muni service plan. The yard includes the following separate structures and major site areas: a two-story maintenance building, two-story tire shop, stand-alone fuel building, and stand-alone wash building. The site is bisected from north to south by Indiana Street. Electrical utility service is provided by the SFPUC.

After revenue service, buses enter the yard from Indiana Street and are parked in unassigned, stacked (nose-to-tail) storage tracks. Individual buses are then pulled from the storage tracks and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lane. After fuel and wash, buses are re-parked in the storage tracks. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked in a row of spaces along the northern site perimeter, between the fuel and wash areas.

As a result of BEB facility conversion scope and high cost of improvements and electrical upgrade, the SFMTA is analyzing a potential full rebuild and expansion of the Woods Yard following completion of Presidio Yard. Woods Yard is inefficient in its site design and the maintenance function limits it to only 40-foot buses, which constrains the SFMTA's overall maintenance flexibility. If a rebuild scenario moves forward for Woods Yard, the anticipated in-service date range would be between 2032-2035.

An aerial and site plan of Woods Yard are presented in Figure 4-16 and Figure 4-17, respectively.

Figure 4-16. Woods Yard - Existing Conditions (Aerial)



Source: Google Earth

Figure 4-17. Woods Yard - Existing Conditions (Site Plan)

Source: WSP

Planned ZEB Modifications

If BEB infrastructure is integrated into the Woods Yard's existing layout, it will be capable of storing 233 total BEBs, of which, 177 can be charged (simultaneously). 158 can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional 19 buses can be charged in the maintenance bays via plug-in dispensers. It is assumed that not all assigned buses will be able to be charged concurrently. As buses finish charging, they should be moved to non-charging positions to allow the next bus to begin charging.

Woods Yard is also candidate for a full rebuild – an option that is still under study. It is assumed that if it is rebuilt, the proposed layout will be designed to charge the entire fleet, simultaneously.

Table 4-8 summarizes the ZEB infrastructure planned at Woods Yard.

Table 4-8. Woods Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	241
No. of BEBs Supported (2040)	233
No. of Charging Cabinets	90
No. of Dispensers/Charging Positions	177

Source : WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio).

The following BEB equipment and locations are proposed:

— 44 DC charging cabinets located primarily on a platform attached to the overhead support structure spanning the southern block of bus parking. These charging cabinets will distribute to 87 pantograph-charging positions mounted from overhead support structures over the existing main bus parking tracks and satellite spaces.

— 36 DC charging cabinets located primarily on a platform attached to the overhead support structure spanning the northern block of bus parking. These charging cabinets will distribute to 71 pantograph-charging positions mounted from overhead support structures over the existing main bus parking tracks and satellite spaces.

— The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.

— In the maintenance building, 10 charging cabinets will be installed and connect to 19 dispensers. The dispensers will be mounted between every two bays. This will provide charging to 37 buses that cannot be charged in the main parking area.

The pantographs and charging cabinets will be served by the following electrical infrastructure:

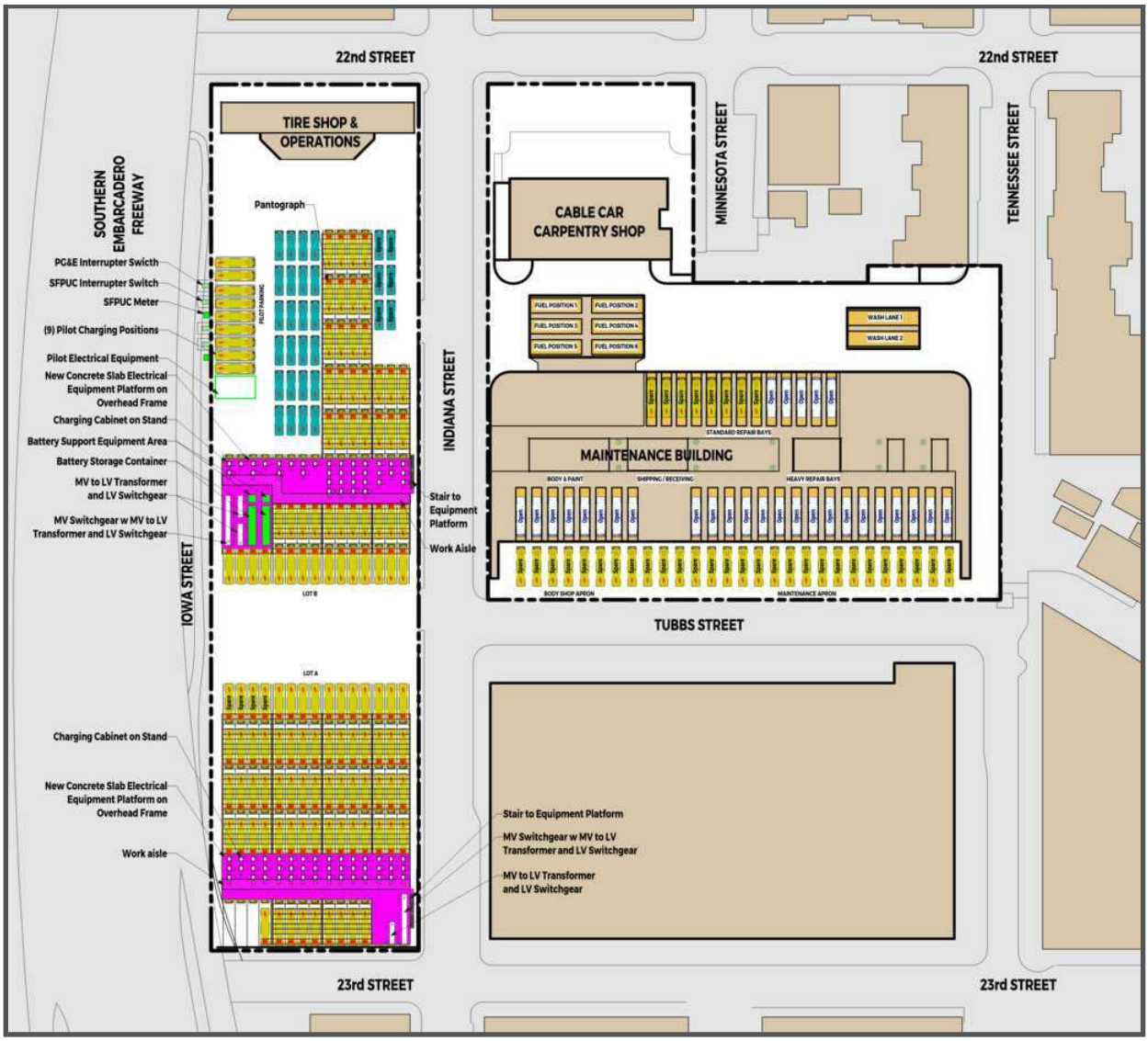
— Two interrupter switch pairs and two meters will be installed on the west side of the site along Iowa Street. The first interrupter in each pair will be owned and operated by PG&E, and the second interrupter in each pair as well as both meters will be owned and operated by SFPUC. Power will transition from the meters to the medium-voltage switchgear located on the two platforms located at the north end of the site and the south end of the site, above the bus parking.

— On the northern platform, one medium-voltage switchgear and three medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed. The switchgear and transformers will be exterior rated.

— On the southern platform, one medium-voltage switchgear and two medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed. The switchgear and transformers will be exterior rated.

Figure 4-18 illustrates the Woods Yard at full build-out.

Figure 4-18. Woods Yard - Full ZEB Build-Out



Source: WSP

Phasing and Construction Strategy

As discussed, the specific phasing for each yard is still being analyzed. However, this section provides details on the proposed improvements in Phase 1 and work to be completed in subsequent phases.

Phase 1

The recommended first phase for the Woods Yard includes the installation of four new interrupter switches and two meters on the exterior of the facility along Iowa Street, routing the utility-provided power into the site along the eastern wall to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Phase 1 will also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the northern block of bus parking.

Future Phases

Each subsequent phase of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the phase. The breakdown of this phasing will follow the SFMTA's growth plans and prioritization schedule.

5 Equity Considerations

The following section provides an overview of disadvantaged communities within the SFMTA's service area and information on how the SFMTA plans to ensure that zero-emission vehicles are prioritized in these communities.

5.1 Disadvantaged Communities

Disadvantaged communities (DACs) refer to areas that suffer the most from a combination of economic, health, and environmental burdens. The California Environmental Protection Agency (CalEPA) and California's Senate Bill 535, define a "disadvantaged" community as a community (census tract) that is located in the top 25th percentile of U.S. Census tracts identified by the results of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen uses environmental, health, and socioeconomic data to measure each census tract (community) in California. Each tract is assigned a score to gauge a community's pollution burden and socioeconomic vulnerability. A higher score indicates a more disadvantaged community, whereas a lower score indicates fewer disadvantages.

The replacement of DHEBs with BEBs will yield many benefits in the communities they serve, including a reduction of noise and harmful pollutants. Given that DACs are disproportionately exposed to these externalities, they should be considered and prioritized during initial deployments of BEBs. The SFMTA will ensure that equity and DACs are prioritized as yards are equipped with charging infrastructure and as buses are deployed on the yard's BEB-compatible blocks.

In addition to upcoming BEB deployments, the SFMTA specifically addresses equity through two focused initiatives: The Muni Service Equity Policy and the Green Zone project.

The SFMTA Service Equity Policy is a process to identify and correct transit performance disparities. The SFMTA has prepared three equity strategy reports since the policy was adopted in 2014. The 2016 Equity Strategy identified seven neighborhoods: Bayview, Chinatown, Excelsior/Outer Mission, Inner Mission, Tenderloin, Visitacion Valley, and Western Addition. The Oceanview/Ingleside neighborhood was added in the 2018 Equity Strategy, and Treasure Island was added in the 2020 Equity Strategy. The intent is that these neighborhoods see improvement equal to or better than the overall system.

The "Green Zone" project, initiated in 2019, utilizes existing technology that permits diesel-hybrid vehicles to run on full electric battery power in select neighborhoods with poor air quality. 68 of these vehicles have larger batteries and a GPS-enabled switch, which will cause the bus to automatically switch to EV mode as it enters geo-fenced areas (Green Zones) throughout the city. The geo-fenced zones were chosen to focus primarily on Muni Equity Strategy neighborhoods, those with high percentages of low-income households and people of color, and where respiratory illnesses occur at a disproportionate rate.

5.2 Summary of The SFMTA's DACs

To understand the potential benefits that ZEBs will provide to DACs in the SFMTA's service area, it is necessary to establish if (1) a yard is in a DAC, and (2) if its routes travel within or alongside a DAC boundary.

As shown in Table 5-1 and Figure 5-1, none of the SFMTA's bus yards are located within a DAC. However, routes that are served from each yard *do* serve DACs – Woods Yard serves the most DACs (12), which account for approximately 6% of all of its communities served. As noted above, several routes

are operated with buses from more than one garage, so a single route in a DAC could be served by multiple yards.

Table 5-1. The SFMTA's Disadvantaged Communities - Yard Summary

Yard	In DAC?	NOx Exempt Area?	Communities Served	DACs Served	Pct. Of DACs Served
Flynn	No	No	102	2	2%
Islais Creek	No	No	112	4	4%
Kirkland	No	No	120	5	4%
Potrero	No	No	74	2	3%
Presidio	No	No	92	4	6%
Woods	No	No	192	12	6%

Source: CalEnviroScreen 3.0

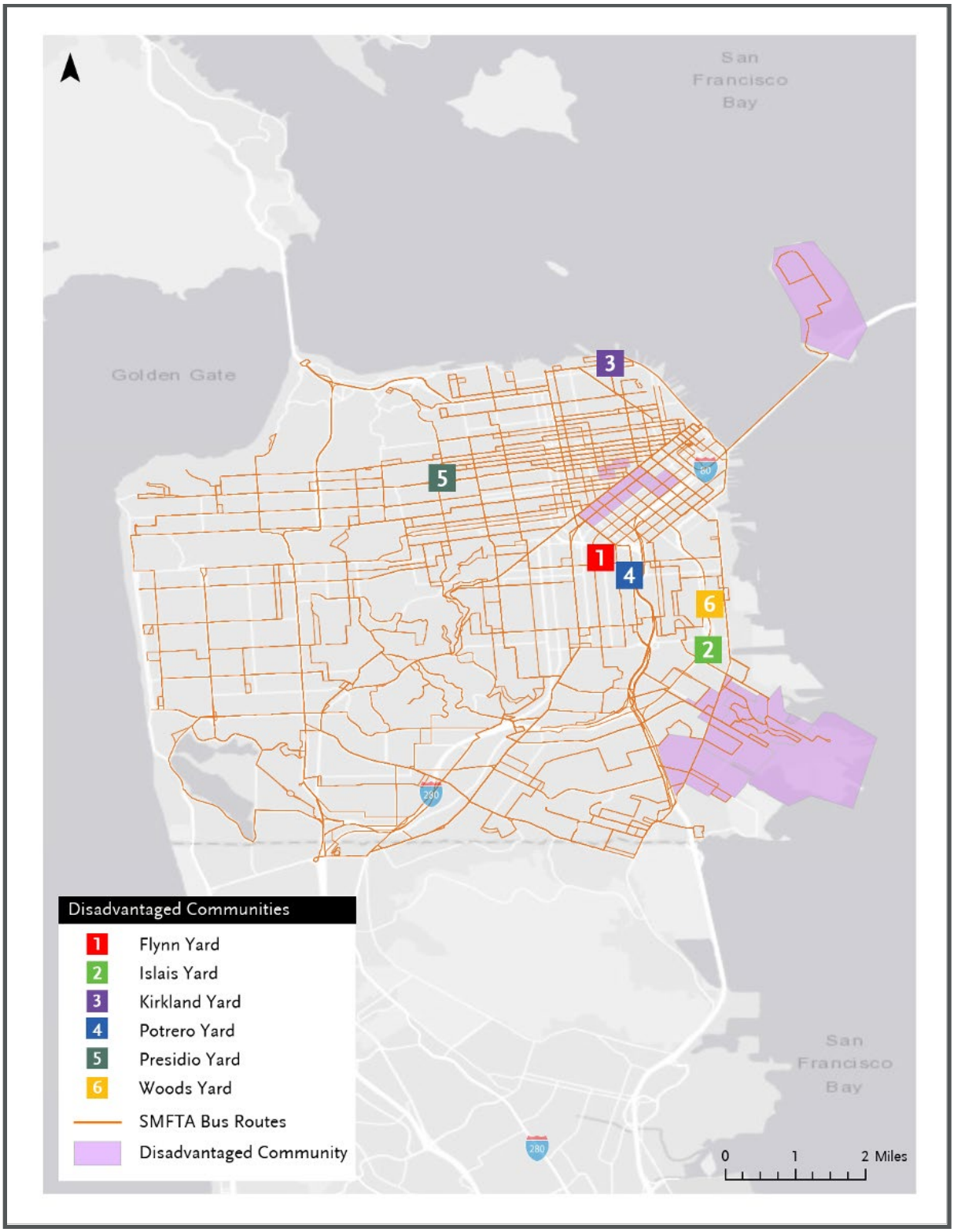
Table 5-2 details the number of DAC-serving routes by yard.

Table 5-2. The SFMTA's Disadvantaged Communities - Route Summary

Yard	No. of DAC-Serving Routes	DAC-Serving Routes
Flynn	5	9R, 14R, 14X, 38R, 714
Islais Creek	7	7, 7X, 8, 8AX, 8BX, 38, 714
Kirkland	6	12, 19, 30, 47, 81X, 83X
Potrero	5	5, 5R, 6, 14, 30,
Presidio	4	21, 24, 31, 45
Woods	22	5, 7, 7X, 9, 23, 25, 27, 29, 38, 44, 54, 81X, 83X, 91, K-OWL, L-OWL, N-OWL, JBUS, KTBUS, LBUS, MBUS, NBUS

Source: CalEnviroScreen 3.0

Figure 5-1. The SFMTA's Disadvantaged Communities and Bus Yards



Source: CalEnviroScreen 3.0

6 Workforce Training

The following section provides an overview of the SFMTA's plan to train personnel on the impending transition.

6.1 Training Requirements

The transition to an allzero-emissionfleet will significantly alter SFMTA's service and operations. Converting to BEBs from their existing DHEBs is logistically complicated and will impact all ranks of the organization.

Training for the operation, maintenance, and handling of BEBs will be conducted after bus procurement and in advance of delivery. Training conditions and schedules will be included in procurement documents, as they are with all existing procurements. For example, SFMTA has already procured nine buses for their pilot project (expected delivery in 2021).[14] Table 6-1 provides an example of training modules that are included with one of their procurements.

It is expected that all relevant personnel will be sufficiently trained before buses arrive. If other OEM-provided buses are procured in the future and/or if new components, software, or protocols are implemented, it is expected that SFMTA's staff will be trained well in advance of the commissioning of these additions.

Table 6-1. Zero-Emission Bus Training Modules (Sample)

Module	Hours
General Vehicle Orientation	8
Multiplex System	32
Entrance and Exit Doors	8
Wheelchair Ramp	4
Brake Systems and Axles	16 (8 per axle)
Air System and ABS	8
Front and Rear Suspension, Steering, and Kneeling	8
Body and structure	4
Propulsion & ESS Fam/HV Safety	24
Charging Equipment	4
Electric HVAC, AC Maintenance (Vendor Specific)	24
Propulsion & ESS Troubleshooting	16
Operator Orientation	8
Towing and Recovery	4

Source: SFMTA, 2019

The following provides a list of personnel and positions that will need to be retrained upon adoption of BEBs (this list is not exhaustive):

[14] Nine buses are currently procured with an additional three in negotiations.

- **Bus Operators and Supervisors**
  Bus operators and field supervision will need to be familiarized with the buses, safety, bus operations, and pantograph operations.

- **Facilities Maintenance Staff**
  Maintenance staff will need to be familiarized with scheduled and unscheduled repairs, high-voltage systems, and the specific maintenance and repair of equipment.

- **First Responders**
  Local fire station staff will need to be familiarized with the new buses and supporting facilities.

- **Tow Truck Service Providers**
  Tow truck providers will need to be familiarized with the new buses and proper procedures for towing ZEBs.

- **Mechanics**
  Mechanics will need to be familiarized with the safety-related features and other components of ZEBs.

- **Instructors**
  Maintenance and bus operator instructors will need to understand all aspects of the transition of ZEBs to train others.

- **Utility Service Workers**
  Staff will become familiarized with proper charging protocol and procedures that are ZEB-specific.

- **Management Staff**
  Maintenance and Operations managerial staff will be familiarized with ZEB operations and safety procedures.

7 Costs and Funding Opportunities

The following section identifies preliminary capital costs and potential funding sources that the SFMTA may pursue in its adoption of ZEBs.

7.1 Preliminary Capital Expenditure Costs

While costs for a full fleet transition are still being analyzed, it is estimated that the costs of chargers, pantographs, buses, and on-site construction, alone, will be in excess of $1.8B (2020 dollars). This estimate is based on a 1:1 bus replacement ratio. The following costs are excluded from the estimate:

- purchase of additional buses (due to range limitations)
- on-site battery storage or photovoltaics
- charge management software
- on-route charging infrastructure
- costs associated with the transition (i.e., temporary relocating and rerouting of service)

The estimate is only based on infrastructure *within* the SFMTA's property lines – it does not consider utility infrastructure enhancements that are required to energize the fleet (design, permitting, and construction of substations, circuits, etc.). The SFMTA has been advised by the SFPUC that it is most likely that PG&E will pass along the cost of any downstream improvements to the SFMTA, at a likely cost of several million dollars per site. Costs are variable and the SFPUC could not provide a per cost mile estimate due to site-specific factors such as age of existing infrastructure, location of existing electrical improvements, density of equipment within the utility vault, etc.

Furthermore, Potrero and Presidio yards (and likely Woods) are planned to be fully rebuilt. An August 2020 cost estimate for the Potrero Yard Modernization Project (bus facility component only) exceeds $406M, not including BEB supporting infrastructure. Prior to the ICT regulation, the current state of the facility has caused the SFMTA to reconsider the priority to rebuild Woods in advance of Kirkland. The SFMTA is still analyzing the facility sequencing and scope of work, with the cost of BEB improvements as a major factor in decision making. The costs associated with the demolition, staging, and construction at these existing sites is also not included with the capital cost estimate.

The cost for BEB improvements at each yard ranges from a low estimate of $130M (Kirkland) to a high of $406M (Potrero). The average capital cost per yard is approximately $303M.

The associated costs of a full fleet transition for each yard is provided in Table 7-1.

Table 7-1. Preliminary Bus and Charger Infrastructure (Only) Expenditure Estimates by Yard

Yard	Buses	Charging Infrastructure (Only)	Total
Flynn	$174.4M	$65.5M	$239.9M
Islais Creek	$236.8M	$83.0M	$319.8M
Kirkland	$101.3M	$28.7M	$130.0M
Potrero	$303.4M	$102.6M	$406.0M
Presidio	$272.3M	$81.8M	$353.1M
Woods	$286.4M	$86.4M	$372.8M
Total	$1.4B	$448M	$1.8B

Source: WSP
Notes: These estimates do not reflect the full facility upgrades required which are highly variable based on state of repair, location, etc. Pending further analysis, there will likely be additional capital improvements and costs to ensure a successful zero-emission vehicle operation, including battery storage, photovoltaics, additional vehicles, contingency components, utility enhancements, etc.
-Rounded to the nearest tenth.

7.2 Potential Funding Sources

There are a number of potential federal, state, local, and project-specific funding and financing sources that may be available to the SFMTA. The SFMTA will monitor funding cycles and pursue opportunities that yield the most benefits for the agency pursuant to the ICT regulation. Table 7-2 identifies the many funding opportunities that the SFMTA may take advantage of in the next 20 years.

Table 7-2. ZEB Funding Opportunities

Type	Agency	Funding Mechanism
Federal	United States Department of Transportation (USDOT)	Better Utilizing Investments to Leverage Development (BUILD) Grants
	FTA	Capital Investment Grants – New Starts
		Capital Investment Grants – Small Starts
		Bus and Bus Facilities Discretionary Grant
		Low- or No-Emission Vehicle Grant
		Metropolitan & Statewide Planning and Non-Metropolitan Transportation Planning
		Urbanized Area Formula Grants
		State of Good Repair Grants
		Flexible Funding Program – Surface Transportation Block Grant Program
	Federal Highway Administration (FHWA)	Congestion Mitigation and Air Quality Improvement Program

Type	Agency	Funding Mechanism
	Environmental Protection Agency (EPA)	Environmental Justice Collaborative Program-Solving Cooperative Agreement Program
	Department of Energy (DOE)	Design Intelligence Fostering Formidable Energy Reduction and Enabling Novel Totally Impactful Advanced Technology Enhancements
State	CARB	Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)
		State Volkswagen Settlement Mitigation
		Carl Moyer Memorial Air Quality Standards Attainment Program
		Cap-and-Trade Funding
	California Transportation Commission (CTC)	Solution for Congested Corridor Programs (SCCP)
	Caltrans	Low Carbon Transit Operations Program (LCTOP)
		Transportation Development Act
		Transit and Intercity Rail Capital Program
		Transportation Development Credits
		New Employment Credit
Local and Project-Specific		Joint Development
		Parking Fees
		Tax Rebates and Reimbursements
		Enhanced Infrastructure Financing Districts
		Opportunity Zones

Source: WSP

8 Start-Up and Scale-Up Challenges

The SFMTA is an industry leader in implementing clean fleets and we share the California Air Resource Board's (CARB) vision to mitigate the impacts of climate change. The transportation sector is San Francisco's largest contributor to the city's overall carbon footprint. As the biggest source of greenhouse gas emissions, it makes up nearly half of all citywide emissions. The pollutants from cars, trucks and other private vehicles account for more than 70% of transportation emissions, while public transportation accounts for only 5% of transportation emissions. SFMTA's transit fleet accounts for less than 2% of public transportation emissions (which is less than .01% of the city's overall greenhouse gas emissions). Our initial analysis identifies significant challenges to further reducing our 2% share of emissions via a full ZE transition by 2040. These include time constraints, unpredictable advancements in ZE technology that could risk transit performance and service reliability, and significant capital, operational, and ongoing maintenance costs while our budget remains impacted by the COVID-19 pandemic. The following list of challenges is not exhaustive, and the SFMTA would like to explore with CARB the additional risks and complications to the ICT regulation.

- **Uncertainty of COVID-19.** COVID-19 has impacted all facets of our global economy, and transit is not an exclusion. During the pandemic, the SFMTA's ridership has plummeted and caused major shortfalls in revenue, resulting in impacts to both capital programs and operations. In addition, a global economic recession that came about with almost no warning is worsening as the COVID-19 crisis persists. At this time, it is unclear what the long-term impacts will be on service. There is a possibility that service ridership levels may not return to previous levels, resulting in changes to procurement and funding. As we look towards our recovery, we believe our limited resources are best used in retaining and growing our ridership. By prioritizing our commitment to providing reliable, high-frequency buses, we will improve environmental conditions at a lower cost than total fleet conversion While current CARB fleet conversion goals will help us further reduce, we believe high quality service is the key to even greater emissions reductions. The SFMTA will continue to analyze trends to determine service changes and plans.

- **Rapid Technological Advancement.** The SFMTA is currently planning for a transition based on the fleet as of September 2020 (with January 2020 service, pre-COVID). The SFMTA will soon need to make decisions on fleet requirements and it is difficult to anticipate future technological changes, such as improved batteries and chargers. The SFMTA (and the market) will have to make decisions to purchase fleets based on what is known at the time of the contract. This exposes the SFMTA to a risk of missing out on improvements that come soon after contract execution, rendering purchased technologies outdated on arrival.

- **Insufficient BEB Performance and Range.** The BEB industry is constantly innovating and developing vehicles with longer ranges and more efficient batteries. However, the SFMTA's analysis currently shows some service blocks that cannot be completed under existing technologies, particularly the hilliest routes. Unless battery technologies evolve, the SFMTA will have to spend additional monies to meet range requirements due to OEM's inability to develop better performing batteries.

- **Resiliency and Emergency Response.** The SFMTA is also seeking solutions to address resiliency and emergency response within the context of a zero-emission fleet. Service that is dependent on electricity is vulnerable during outages and emergencies. In addition, the SFMTA provides regional emergency responses and high-capacity evacuation for wildfires, which would be challenging to do with reduced bus ranges, such as zero-emission vehicles. Thus, the SFMTA is considering retaining

a DHEB sub fleet for these rare occasions, although we acknowledge this fleet would not be CARB-compliant.

- **High Capital and O&M Costs.** To maintain pre-COVID-19 service with BEBs (with existing technologies), the SFMTA would need more vehicles (more than a 1:1 replacement ratio). The SFMTA's facilities are at crush capacity and cannot accommodate even 10% more vehicles. Therefore, to convert with current technologies, the SFMTA would have to acquire additional real estate and build new facilities, which is a daunting and extremely expensive endeavor. Additionally, the SFMTA's buses operate on some of the steepest grades in the US. The gradeability will require the SFMTA to purchase extended warranties (likely 12-year) which increases the purchase price of each bus, and it can also lead to more expensive midlife overhaul costs – further ballooning the lifecycle costs of the transition.

- **Uncertain Capital Funding Streams in a Major Economic Recession.** Adoption of BEBs has many benefits, including potential lifecycle cost savings. However, the investment required for capital and change management is significant. In an increasingly constrained funding environment, and with little to no operating reserves due to the recession induced by COVID-19, the SFMTA does not have funds for these capital projects if specific funding streams are not identified through other resources. The conversion of the SFMTA's bus facilities to accommodate BEBs is especially complex, particularly given the 2040 time horizon. Like much of United States' public infrastructure, the SFMTA is faced with aged, obsolete facilities and significant deferred maintenance due to decades without flexible facility funding. The SFMTA's Building Progress Program, a facility capital renewal program, aims to strategically address this state of disrepair by rebuilding the SFMTA's oldest and most obsolete facilities. This ambitious and billion-dollar program includes BEB adaptability of two yards but leaves four with no funding framework for the significant modifications that BEB requires.

  To electrify the full fleet by 2040, SFMTA would need to have multiple yards undergoing construction concurrently. In addition, the high cost of the improvement requires a cost-benefit analysis of making BEB improvements without addressing existing condition of the facilities. For at least two facilities (Kirkland and Woods), BEB conversion without complete rebuild of the sites is not fiscally responsible. This clearly adds additional budget, schedule, and risk complexity to the BEB conversion decision matrix.

- **Strains on Market Supply.** The ICT regulation will put a lot of pressure on OEMs to produce ZEBs at unprecedented rates. However, it is not only California that is interested in converting to ZEBs. These monumental policy changes make it challenging to meet ZEB goals for agencies if the supply of buses cannot meet demand. This may cause strains on supply, resulting in risk to meeting purchase requirement deadlines. If the supply industry cannot keep up and we end up with a less reliable vehicle, this could suppress transit use and not meet program goals. We cannot go electric if vehicles are not reliable.

- **Transition Complexity**. Maintaining service and adhering to ICT regulation purchase requirements, all while managing on-site construction, facility rebuilds, temporary bus relocations, bus procurements, and utility enhancements introduces a lot of risk to the SFMTA's program. If one element of this transition doesn't go as planned, there will be implications for other components of the program.

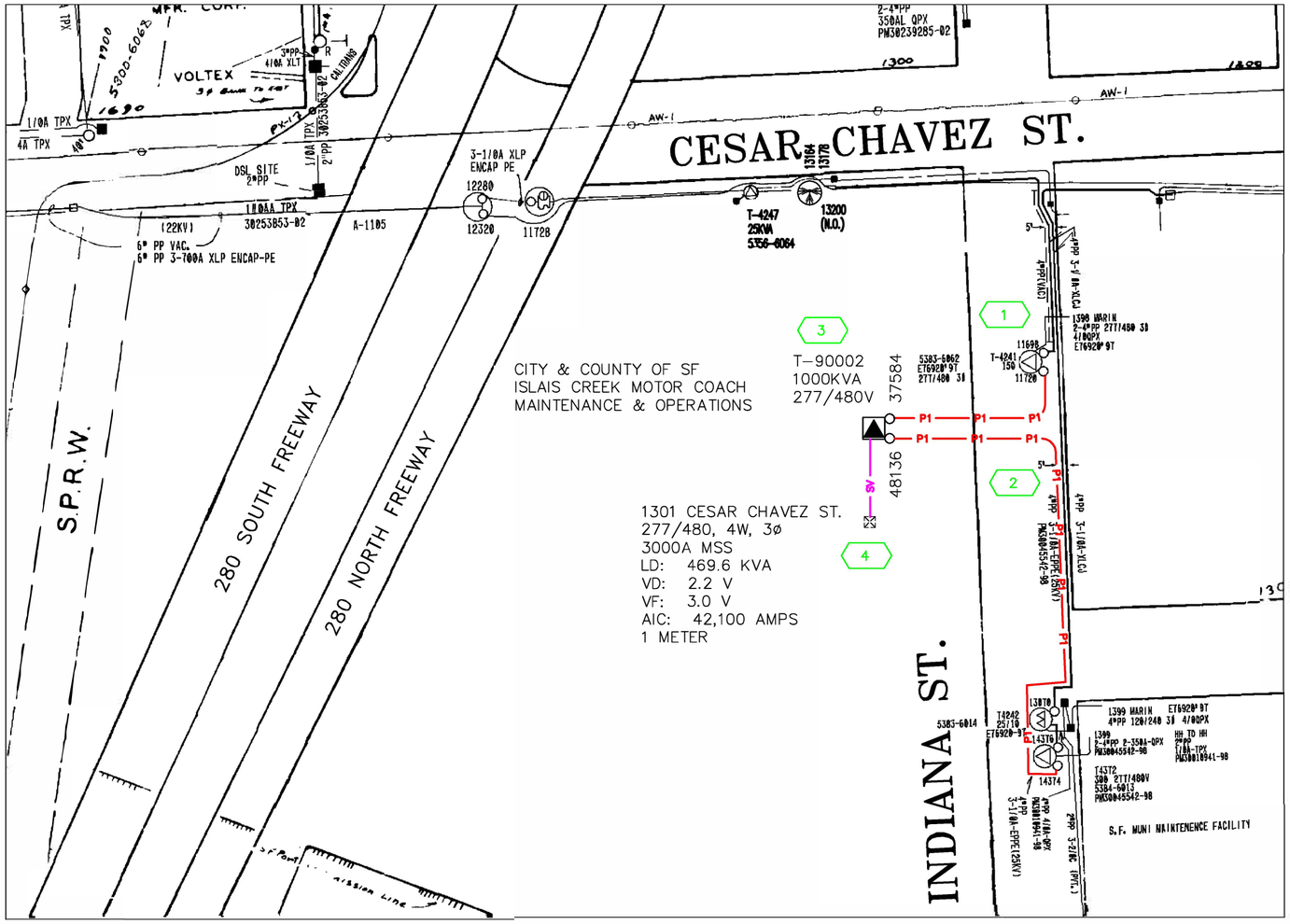
- **Dependence on SFPUC and PG&E Enhancements**. All of the SFMTA's yards will require additional electrical service and infrastructure. Installation of the support structure and charging equipment (chargers, switchgear, transformer, etc.) will impact transit operations. To date, PG&E has not

provided a path for the SFMTA to collaborate on planning for electrical service enhancement at the SFMTA bus yards, despite the San Francisco Public Utilities Commission's (SFPUC) persistence. Additionally, it is anticipated that utility infrastructure enhancements will also need to occur outside of the SFMTA's property lines, which may require for upstream improvements to the power grid. Current cost estimates do not consider these improvements, and the SFMTA has been advised by the SFPUC that PG&E will most likely pass these costs to the SFMTA at the likely cost of several million dollars per site.

- **Additional Strain on PG&E Resources.** Further complicating the SFMTA's dependency on PG&E coordination is the State's competing policies, programs, and regulation of other electric fleets, including commercial fleets and private vehicles. As State transportation electrification efforts take hold, PG&E will be incentivized to address the needs of rate-paying customers first. The SFMTA anticipates that commercial rate-paying customers will be prioritized over the SFMTA (as a wholesale customer).

- **The Results of the SFPUC Power Rate Study.** The SFPUC is currently undertaking an analysis of their rate structure. The SFMTA currently pays a wholesale distribution rate and receives power to its traction power system and facilities at very favorable rates. The outcome of this study and any resulting rate change impacts the SFMTA's cost to convert from DHEB to BEB.

- **Managing Power Demand**. The transition to BEBs will require strategies to ensure that the SFMTA can utilize power in the most efficient way. The SFMTA is coordinating with utility providers to determine methods to reduce peak demands. However, managing demand may also come at a hefty capital cost, something that staff is currently analyzing.



MISC. NOTATIONS:

APPLICANT TO INSTALL 106"X90 TRANSFORMER PAD
APPLICANT TO TRENCH & INSTALL 69' 2-4"PP FROM TX PAD TO EXISTING 4" DUCTS ACROSS STREET
PG TO TURN AND CONNECT EXISTING 4" CONDUIT

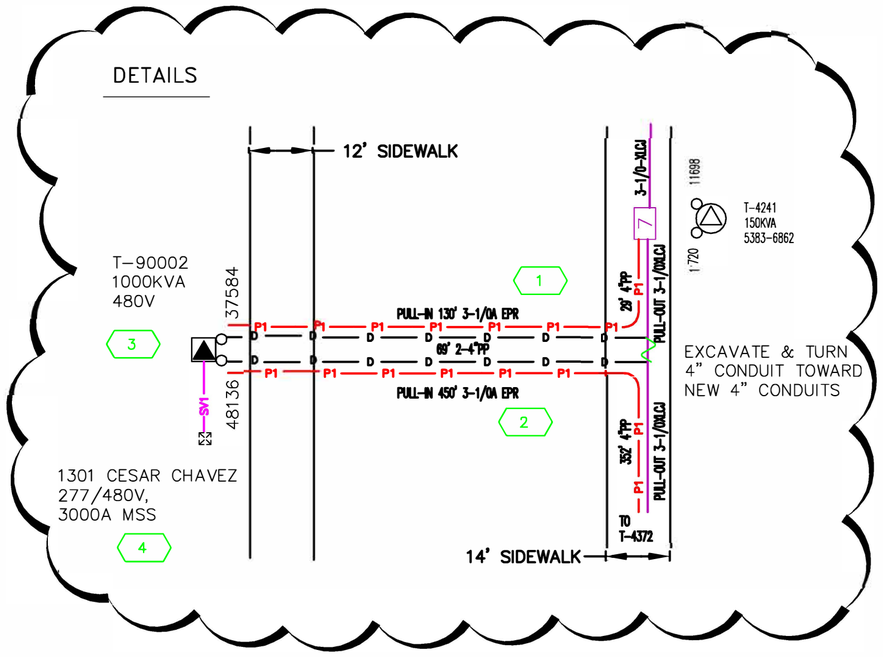
LOCATIONS:

LOC. 1
DISCONNECT 3-1/0XLCJ PRIMARY CABLE FROM T-4241 @ SW 11720
PG TO PULL-IN 130' 3-1/0A EPR PRIMARY CABLE INTO CUSTOMER-INSTALLED 4" PRIMARY CONDUIT

LOC. 2
DISCONNECT 3-1/0XLCJ PRIMARY CABLE FROM T-4372 @ SW 14374
PG TO PULL-OUT 403' 3-1/0XLCJ PRIMARY CABLE
PG TO EXCAVATE & TURN 2-4" CONDUITS TOWARD NEW 4" CONDUITS
PG TO PULL-IN 450' 3-1/0A EPR PRIMARY CABLE INTO CUSTOMER-INSTALLED 4" PRIMARY CONDUIT

LOC. 3
INSTALL 1000KVA 480V PADMOUNT TRANSFORMER ONTO NEW TX PAD

LOC. 4
PG TO CONNECT THE BUS DUCT ENTRANCE TERMINATION UNIT
SET METER TO 1301 CESAR CHAVEZ STREET



C-5-1
12KV #18
A-1105

AMY HWA (695-3460)

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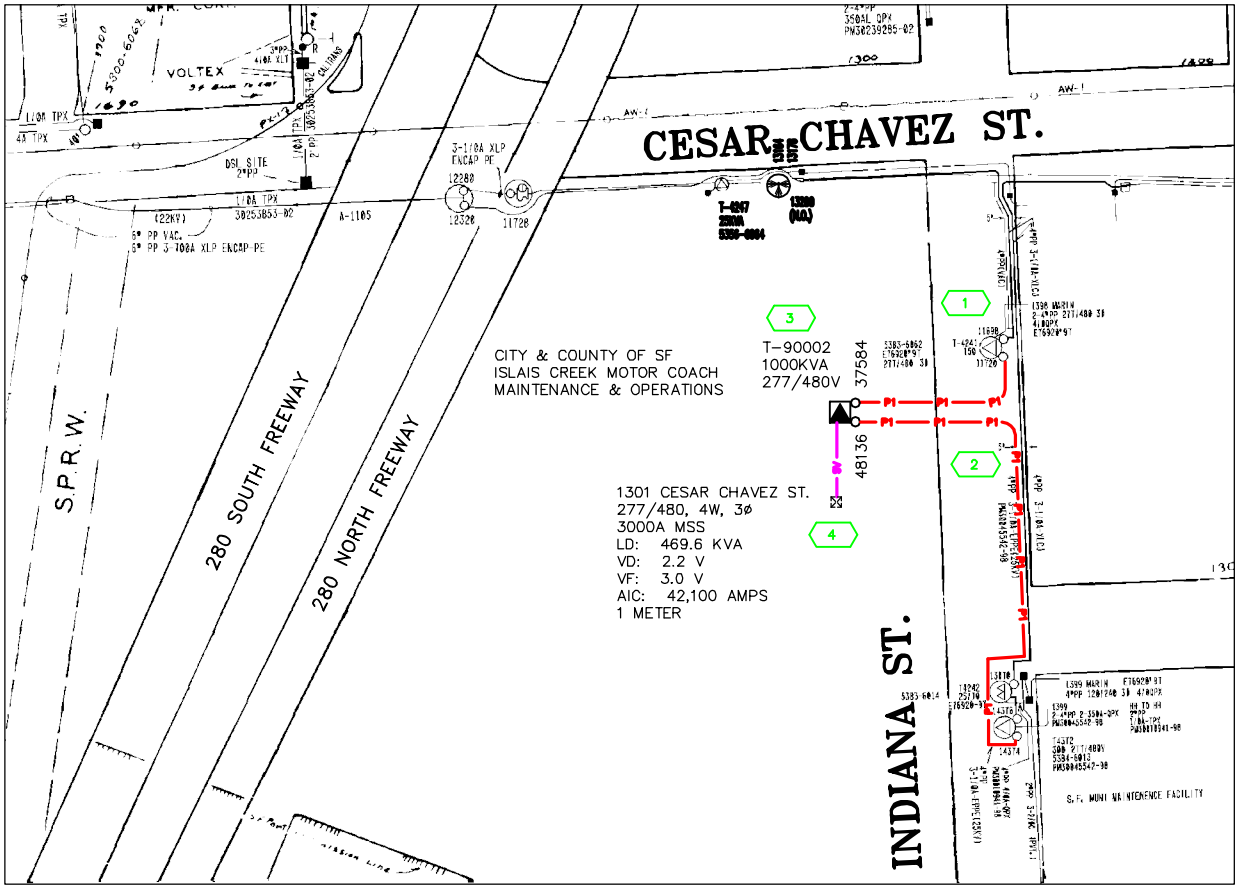
SD:
NOTIF.: 10374021 9
Other:
SHT: 2 OF 2 SHEETS
PM: 30728847 REV.

ENGINEERING AND PLANNING DEPT.
2180 HARRISON STREET
SAN FRANCISCO, CA 94110
FAX #:
PHONE #:
PACIFIC GAS AND ELECTRIC COMPANY

EST: ACH
ADE: JGH
SUPV: DHL
REP.: S1KQ
PLNR: LMS
SCALE: NTS
DATE: 8-31-2011

CCSF - MUNI MAINTENANCE FACILITY
1301 CESAR CHAVEZ STREET
INSTALL 1000KVA PADMOUNT TRANSFORMER
INSTALL 3000A MSS SERVICE

453



MISC. NOTATIONS:

APPLICANT TO INSTALL 106"X90 TRANSFORMER PAD
APPLICANT TO TRENCH & INSTALL 69' 2-4"PP FROM TX PAD TO EXISTING 4" DUCTS ACROSS STREET
PG TO TURN AND CONNECT EXISTING 4" CONDUIT

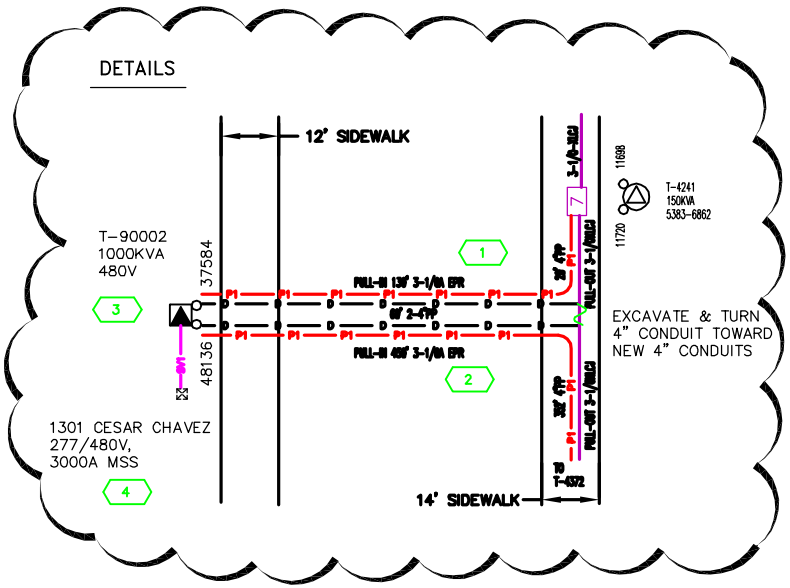
LOCATIONS:

LOC. 1
DISCONNECT 3-1/0XLCJ PRIMARY CABLE FROM T-4241 @ SW 11720
PG TO PULL-IN 130' 3-1/0A EPR PRIMARY CABLE INTO CUSTOMER-INSTALLED 4" PRIMARY CONDUIT

LOC. 2
DISCONNECT 3-1/0XLCJ PRIMARY CABLE FROM T-4372 @ SW 14374
PG TO PULL-OUT 403' 3-1/0XLCJ PRIMARY CABLE
PG TO EXCAVATE & TURN 2-4" CONDUITS TOWARD NEW 4" CONDUITS
PG TO PULL-IN 450' 3-1/0A EPR PRIMARY CABLE INTO CUSTOMER-INSTALLED 4" PRIMARY CONDUIT

LOC. 3
INSTALL 1000KVA 480V PADMOUNT TRANSFORMER ONTO NEW TX PAD

LOC. 4
PG TO CONNECT THE BUS DUCT ENTRANCE TERMINATION UNIT
SET METER TO 1301 CESAR CHAVEZ STREET



C-5-1
12KV #18
454-1105

AMY HWA (695-3460)

LEGEND

Based on SFMTA_Fleet_Projections_4.6.21.xlsx File

30' Diesel		8
30' Diesel Spare (20%)	Spare	2
60' Diesel		84
60' Diesel Spare (20%)	Spare	21
TOTAL ASSIGNED BUSES:		115
30' Open	Open	8
60' Open	Open	40
TOTAL OPEN POSITIONS:		48

TOTAL AVAILABLE PARKING

163

PROJECT NO.	189247
DRAWN BY	ESR
DATE	10/27/2021
SCALE	11x17: 1"=80' 22x34: 1"=40'

PROJECT TITLE
SFMTA ZE
FACILITY PLAN
ISLAIS DIVISION

WSP USA Inc.
16200 PARK ROW
SUITE 200
HOUSTON, TEXAS 77084
TEL: (281) 589-5900
FAX: (281) 759-5164

DRAWING TITLE
PHASING
EXISTING
ALL PHASES

DRAWING NUMBER
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LEGEND

Based on SFMTA_Fleet_Projections_4.6.21.xlsx File

30' Diesel		8
30' Diesel Spare (20%)	Spare	2
60' Diesel		84
60' Diesel Spare (20%)	Spare	21
TOTAL ASSIGNED BUSES:		115
30' Open	Open	8
60' Open	Open	34
TOTAL OPEN POSITIONS:		42
TOTAL AVAILABLE PARKING		**157**

Relocated Buses

60' Diesel		6

NARRATIVE OF PHASING

1. Prepare and Isolate Area for New Construction. Area Unusable to Owner During Construction

2. Prepare Area for New Construction. Area to Retain Function During Pull-in/Pull-out Times

3. Relocate Buses to This Location

PROJECT NO.	189247
DRAWN BY	Author
DATE	11/08/21
SCALE	1" = 40'-0"

PROJECT TITLE
SFMTA ZE
FACILITY PLAN
ISLAIS DIVISION

WSP USA Inc.
16200 PARK ROW
SUITE 200
HOUSTON, TEXAS 77084
TEL: (281) 589-5800
FAX: (281) 759-5164

DRAWING TITLE
POTENTIAL
60' BEB LAUNCH PHASE
RELOCATE BUSES

DRAWING NUMBER
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Category: TASK 3 REPORT - Set: PHASING

LEGEND

Based on SFMTA_Fleet_Projections_4.6.21.xlsx File

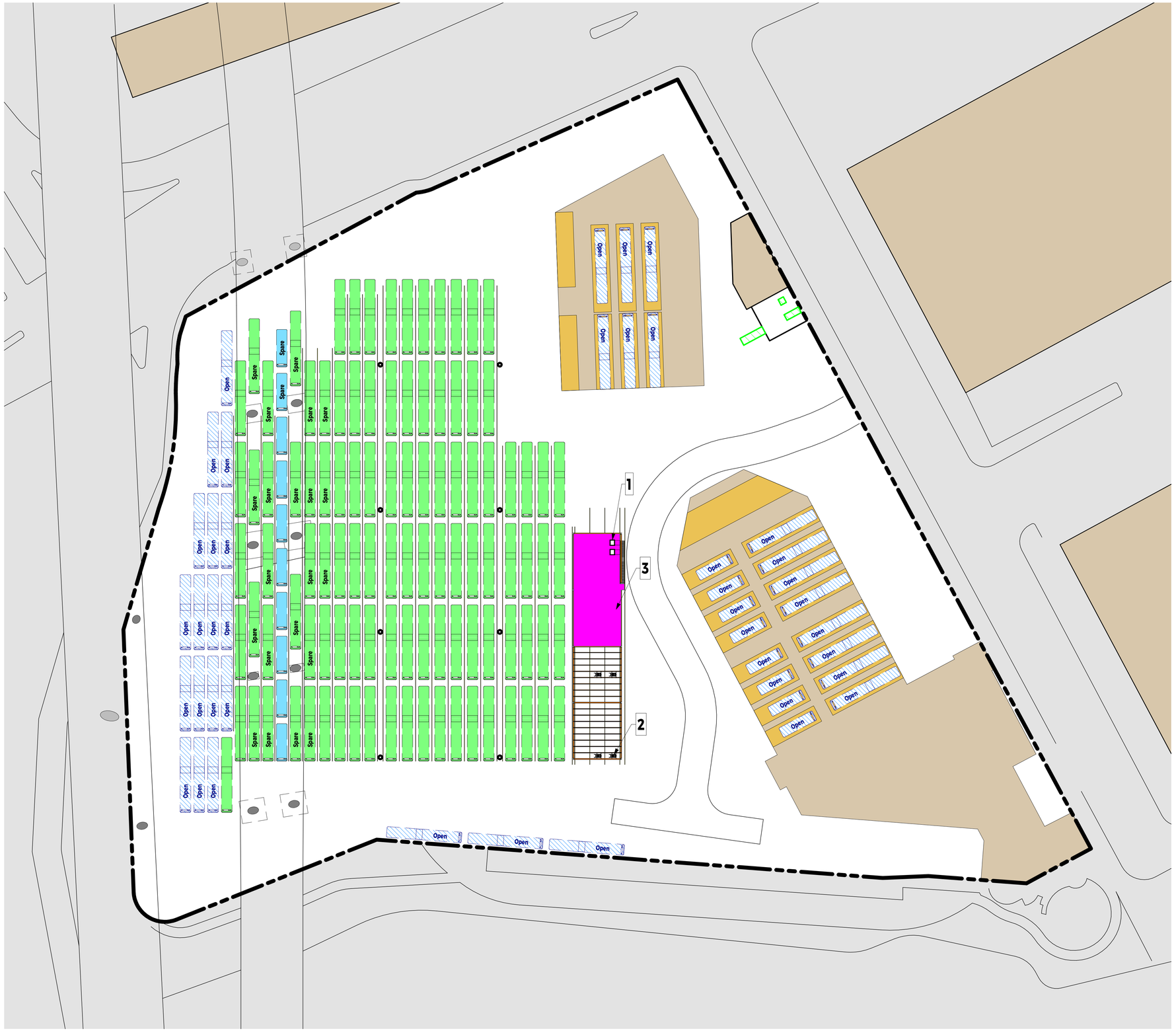
30' Diesel		8
30' Diesel Spare (20%)	Spare	2
60' Diesel		84
60' Diesel Spare (20%)	Spare	21
TOTAL ASSIGNED BUSES:		115
30' Open	Open	8
60' Open	Open	34
TOTAL OPEN POSITIONS:		42
TOTAL AVAILABLE PARKING		**157**

Equipment Count

Charging Cabinet	2
Pantograph	6

NARRATIVE OF PHASING

1. New 1:3 Charge Cabinet to Pantographs w/ Overhead Structure
2. New Pantograph Mounted to Overhead Structure
3. New Overhead Platform for Electrical Equipment



PROJECT NO.	189247
DRAWN BY	Author
DATE	11/08/21
SCALE	1" = 40'-0"

PROJECT TITLE
SFMTA ZE
FACILITY PLAN
ISLAIS DIVISION

WSP USA Inc.
16200 PARK ROW
SUITE 200
HOUSTON, TEXAS 77084
TEL: (281) 589-5800
FAX: (281) 759-5164

DRAWING TITLE
POTENTIAL
60' BEB LAUNCH PHASE
NEW OVHD STRUCTURE

DRAWING NUMBER
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LEGEND

Based on SFMTA_Fleet_Projections_4.6.21.xlsx File

30' Diesel		8
30' Diesel Spare (20%)	Spare	2
60' BEB		6
60' Diesel		84
60' Diesel Spare (20%)	Spare	21
TOTAL ASSIGNED BUSES:		121
30' Open	Open	8
60' Open	Open	37
TOTAL OPEN POSITIONS:		45
TOTAL AVAILABLE PARKING		**166**

New Buses

60' BEB		6

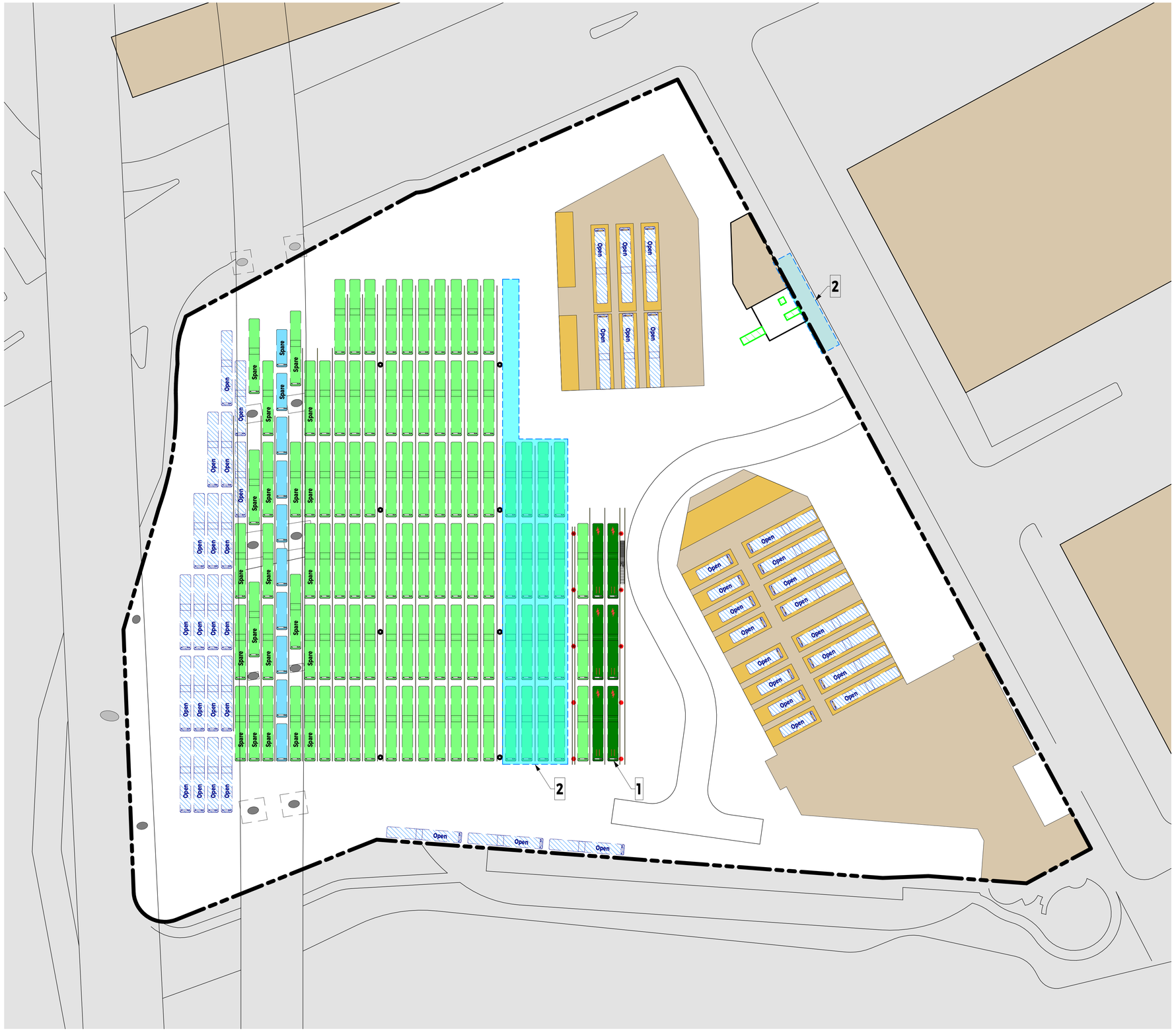
Equipment Count

Charging Cabinet	2
Pantograph	6

NARRATIVE OF PHASING

1. Upon Work Completion, Owner to Park New BEBs at New Parking Location

2. Prepare to Isolate Area for Future Construction



PROJECT NO. 189247
DRAWN BY Author
DATE 11/08/21
SCALE 1" = 40'-0"

PROJECT TITLE
SFMTA ZE
FACILITY PLAN
ISLAIS DIVISION

WSP USA Inc.
16200 PARK ROW
SUITE 200
HOUSTON, TEXAS 77084
TEL: (281) 589-5800
FAX: (281) 759-5164

DRAWING TITLE
POTENTIAL
60' BEB LAUNCH PHASE
NEW BUS PARKING

DRAWING NUMBER
I PH 1A.3

1/7/22 1:52:39 PM

BIM 360://HOU-189247A - SFMTA ZE Plan - R19/SFMTA Islais Creek.rvt
Category: TASK 3 REPORT - Set: PHASING

LEGEND

Based on SFMTA_Fleet_Projections_4.6.21.xlsx File

30' Diesel		8
30' Diesel Spare (20%)	Spare	2
60' Diesel		84
60' Diesel Spare (20%)	Spare	21
TOTAL ASSIGNED BUSES:		115

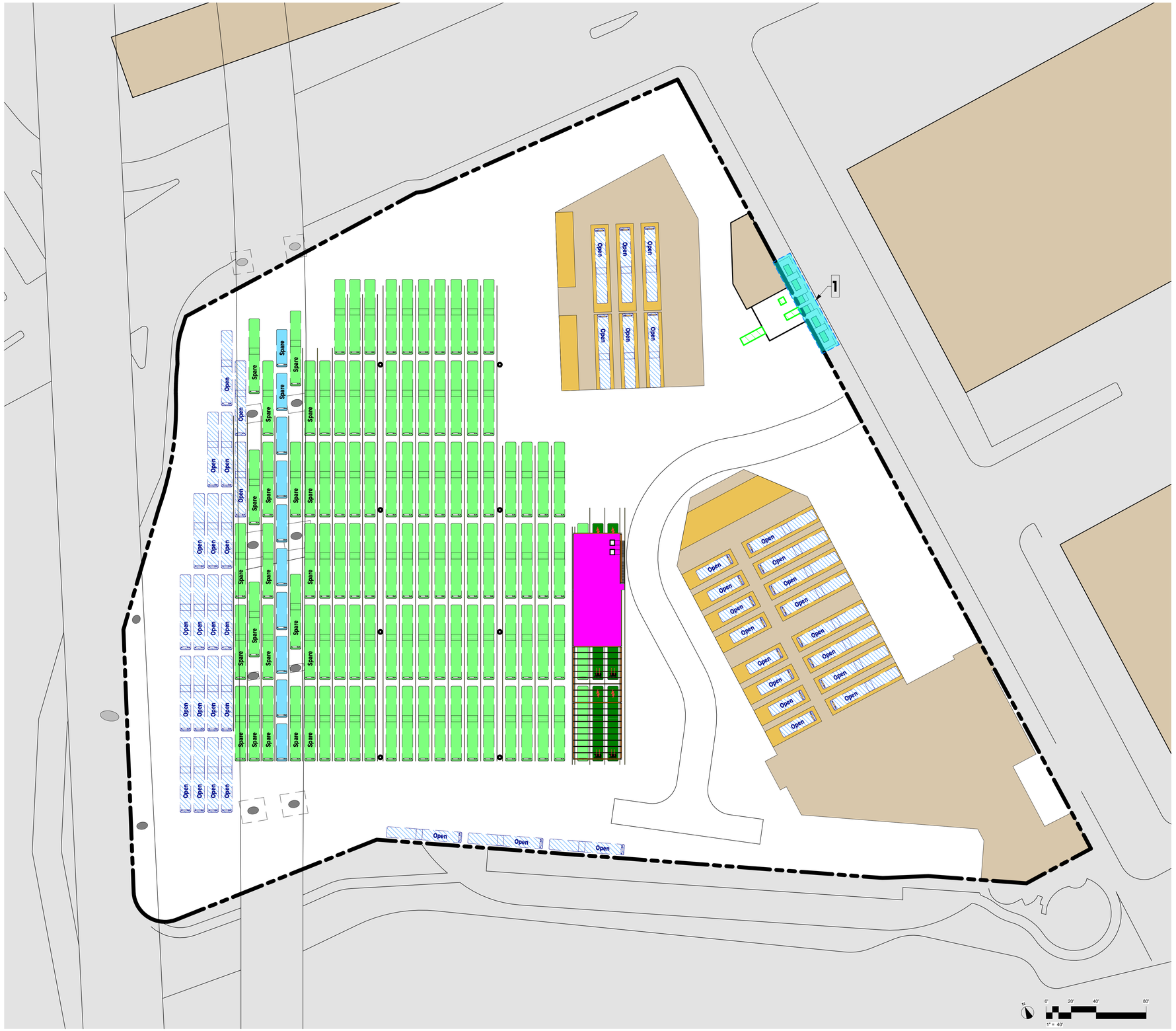
30' Open	Open	8
60' Open	Open	40
TOTAL OPEN POSITIONS:		48

TOTAL AVAILABLE PARKING

163

Equipment Count

Charging Cabinet	2
Pantograph	6



NARRATIVE OF PHASING

1. Installation of New Electriucal Equipment. Can Be Concurrent with Phase 1

PROJECT NO.	189247
DRAWN BY	ESR
DATE	10/27/2021
SCALE	11x17: 1"=80' 22x34: 1"=40'

PROJECT TITLE
SFMTA ZE
FACILITY PLAN
ISLAIS DIVISION

WSP USA Inc.
16200 PARK ROW
SUITE 200
HOUSTON, TEXAS 77084
TEL: (281) 589-5800
FAX: (281) 759-5164

DRAWING TITLE
PHASING
PHASE 0
NEW ELEC. INF.

DRAWING NUMBER
I PH 0.1

1/7/22 1:52:14 PM

BIM 360://HOU-189247A - SFMTA ZE Plan - R19/SFMTA Islais Creek.rvt
Category: TASK 3 REPORT - Set: PHASING

5 ISLAIS CREEK YARD

5.1 EXISTING CONDITIONS

This section summarizes Islais Creek Yard's current service parameters, location and facilities configuration, and existing electrical infrastructure.

5.1.1 *SERVICE DESCRIPTION AND REQUIREMENTS*

Islais Creek Yard operates 116 service blocks, 115 of which are served by 60-foot buses with one block served by 40-foot buses. This fleet travels a total of 9,304 miles during a typical weekday. The average weekday block distance is 77 miles and the longest distanced traveled is 189 miles. The number of stops for each block varies widely with an average of 316. The service blocks at this yard travel along an accumulative grade of 19% (Table 5-1).

Table 5-1. Existing Service Conditions at Islais Creek Yard

Total Distance Traveled (mi.)	Average Distance Traveled (mi.)	Max Distance Traveled (mi.)	Average Number of Stops	Accumulative Slope
8,894	77	189	316	19%

Source: WSP

5.1.2 *LOCATION AND FACILITIES*

Islais Creek Yard is located at 1301 Cesar Chavez Street in the City of San Francisco.

Currently, 115 diesel-hybrid buses (10 30-foot and 105 60-foot) are stored, maintained, fueled, and serviced at Islais Creek Yard. The yard includes the following separate structures and major site areas: a two-story maintenance building, two-story transportation building, and a combined fuel, wash, and tire repair building. Interstate 280 (I-280) traverses the western side of the site with support columns located in the bus parking yard. Electrical utility service is provided by the SFPUC.

Islais Creek Yard is in an area expected to be affected by sea level rise flooding as early as 2030 (Appendix C: Risk Management Plan). This site currently experiences intermittent flooding due to major rain events and seasonal high tides, due to poor drainage surrounding the site. A majority of the BEB infrastructure will be installed overhead on an elevated platform, out of the usual flood zones. However, until capital improvements to mitigate flooding caused by poor drainage around the site beyond the control of this site are implemented, additional planning will be required to minimize the effect of flood waters to new BEB infrastructure that will be installed at grade.

In addition, portions of the site are not owned by the SFMTA. The site is bisected by the I-280 freeway. The west side of the freeway is leased to the SFMTA by Caltrans, and there are no-build provisions for the area underneath the freeway. Additional planning will need to be done to ensure that any permanent structures are not intruding in any no-build zones.

An aerial and existing site plan of Islais Creek Yard are presented in Figure 5-1 and Figure 5-2, respectively.

Figure 5-1. Islais Creek Yard – Existing Conditions (Aerial)

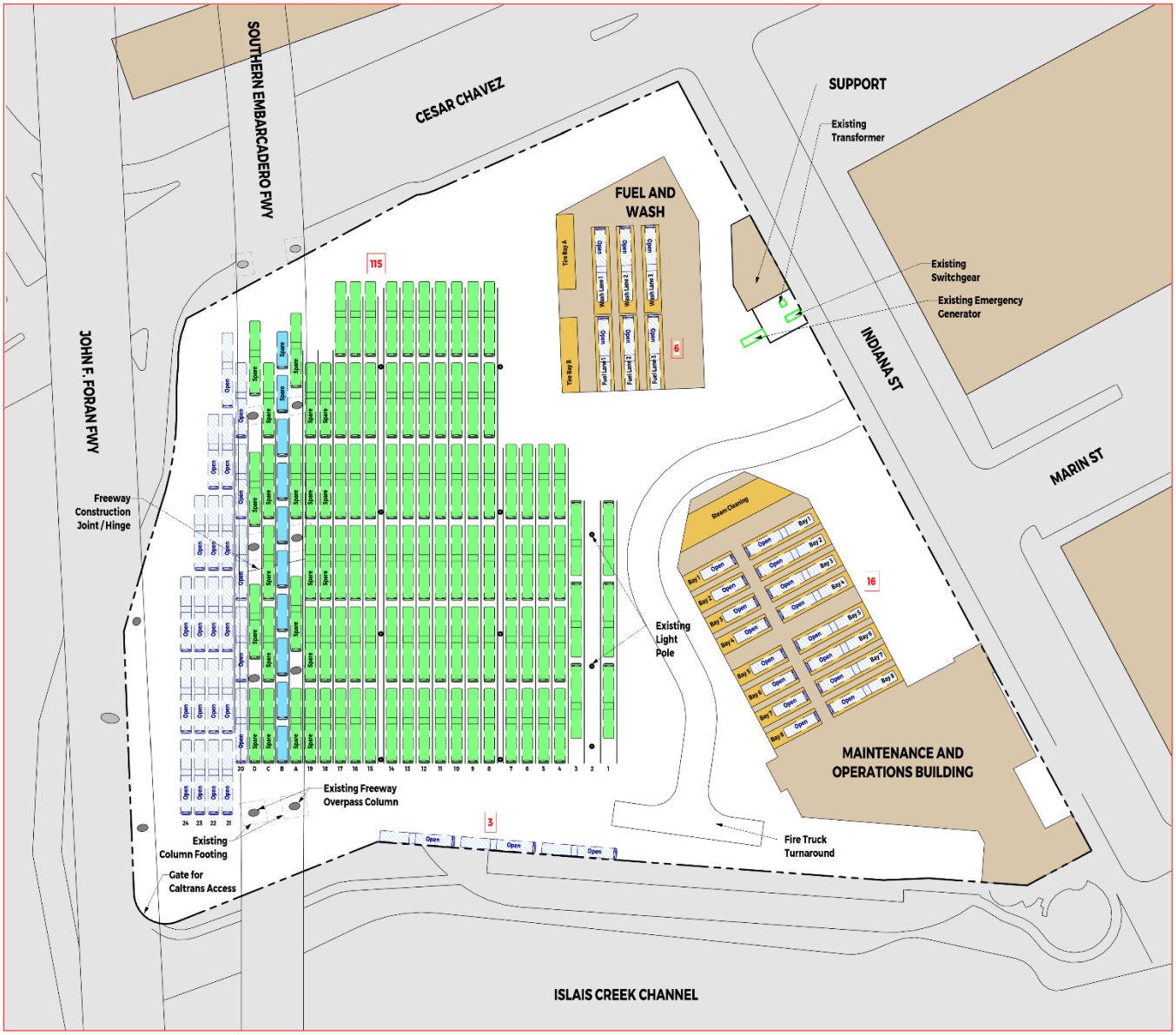
Source: Google Earth

SITE CIRCULATION

Buses enter from Indiana Street and are parked in numbered spaces and stacked (nose-to-tail) in 11 or 13 foot-wide lanes (Track 1 is easternmost). Individual buses are then pulled from the storage area and taken by nightly service staff to the fuel lanes for fare retrieval, interior cleaning, and fueling before pulling forward to the bus wash lanes. After fuel and wash, buses are re-parked in the storage area. Buses remain parked until morning pull out unless a maintenance issue has been identified. NRVs are parked throughout the site on facility exteriors and the yard perimeter.

Figure 5-2 presents Islais Creek Yard's existing parking and facilities with I-280 crossing above the site. Green buses represent 60-foot buses, yellow buses represent 40-foot buses, and blue buses represent 30-foot buses.

Figure 5-2. Islais Creek Yard – Existing Site Plan



Source: WSP

5.1.3 *ELECTRICAL INFRASTRUCTURE*

The following section provides information on the existing substation, circuit, and transformer that support Islais Creek Yard's electrical needs.

SUBSTATION

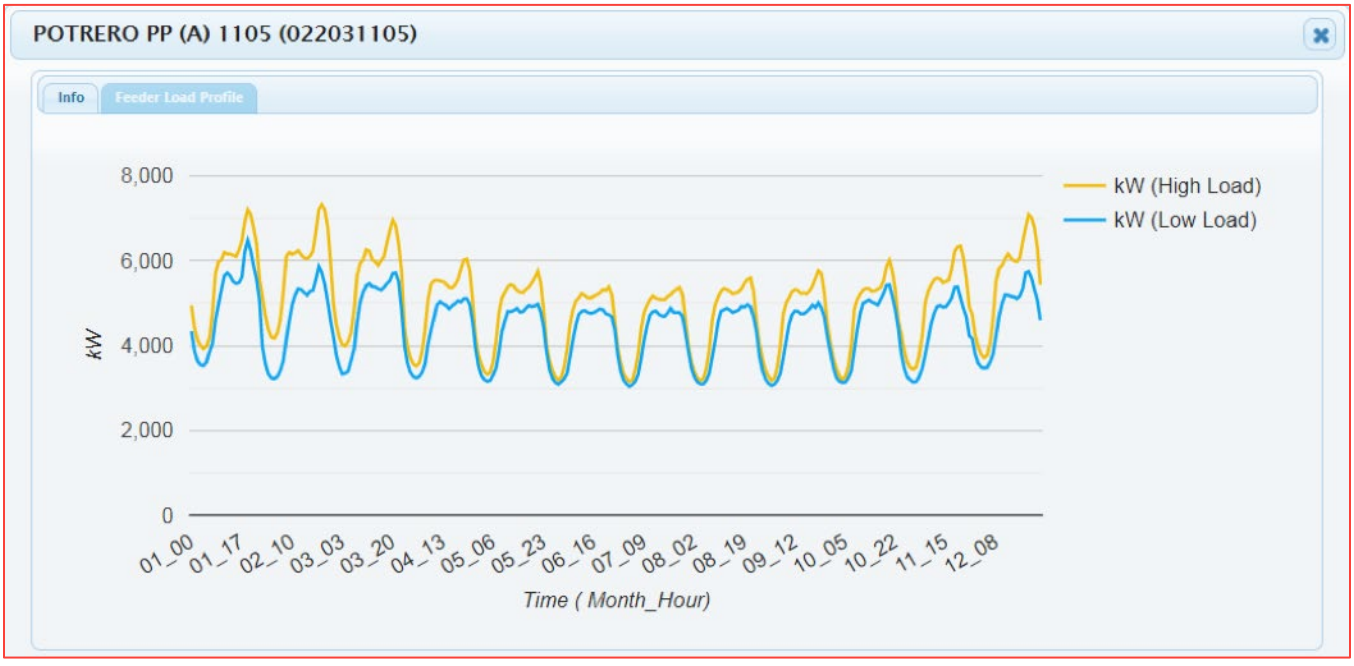
Islais Creek Yard's power is provided by the Potrero Substation that is located along Illinois Street between 23rd Street and 24th Street, approximately 0.5 miles from the yard. The Potrero Substation serves multiple SFMTA sites, including Flynn, Potrero and Woods yards. The Potrero Substation has a distribution capacity of 74 MW. The POTRERO PP (A) 1105 Circuit (Potrero 1105 Circuit) feeds Islais Creek Yard.

CIRCUIT

The Potrero 1105 Circuit is a 12 kV circuit that is fed from the Potrero Substation A. The Potrero 1105 circuit has an existing capacity of 9.99 MW. PG&E estimates that the projected peak load of this circuit is 5.14 MW, leaving approximately 4.85 MW of available capacity. The circuit enters the yard from the Indiana Street side of the property which enters the Annex Building.

Peak loads for the Potrero 1105 Circuit are monitored by PG&E and published on their ICA Map. The load increases in winter months and has peaks at 9:00 AM and 8:00 PM. Usage is at its minimum between 2:00 AM and 6:00 AM. The metrics for this circuit are shown in Figure 5-3 and Table 5-2.

Figure 5-3. Islais Creek Yard - Potrero 1105's Load Profile



Source: PG&E

Table 5-2. Islais Creek Yard – Potrero 1105's Load Information

Description	Data
Feeder Name	POTRERO PP (A) 1105
Feeder Number	022031105
Nominal Circuit Voltage (kV)	12
Circuit Capacity (MW)	9.99
Circuit Projected Peak Load (MW)	5.14
Substation Bank	1
Substation Bank Capacity (MW)	74.3
Substation Bank Peak Load (MW)	46.68
Existing Distributed Generation (MW)	0.43
Queued Distributed Generation (MW)	0
Total Distributed Generation (MW)	0.43
Total Customers	203
Residential Customers	1
Commercial Customers	136
Industrial Customers	57
Agricultural Customers	0
Other Customers	9

Source: PG&E

TRANSFORMER

Islais Creek Yard's transformer is located in the electric yard of the Annex Building.

5.2 MODELING RESULTS

The following section presents the blocks completed, fleet requirements, and service phasing strategies emerging from the simulation model for the service blocks operating out of Islais Creek Yard.

5.2.1 *BLOCK COMPLETION*

Between 75% and 98% of all the blocks operating out of Islais Creek Yard (operated by 40-foot and 60-foot buses) can complete current service requirements with current BEB technology based on the three degrees of efficiency described in Section 2.1. Under conservative efficiency estimations, 42 blocks exceed the energy requirements that can be provided by current BEB technologies. Under the moderate scenario, 29 blocks failed. Only two blocks failed under the optimistic scenario (Table 5-3).

Figure 5-4 illustrates the percent of block distances that can be completed with current BEB technologies for the fleet operating out of Islais Creek Yard. This figure demonstrates the degree to which the technology fell short of service requirements, for example, a BEB may have completed 99% of the block and still technically fail. Under the most optimistic scenario, the full fleet at Islais Creek Yard can only complete 90% of the service requirements in a typical weekday. Under moderate efficiency estimations, the full fleet could only achieve approximately 50% of the service distance required. This low performance is likely the result of the lower vehicle range provided by 60-foot buses. This indicates that the transition phasing for 20% to 30% of the Islais Creek Fleet may need to be

delayed until later in the transition goal period as technology improves. Alternatively, modifications to service scheduling or on-route charging may be required.

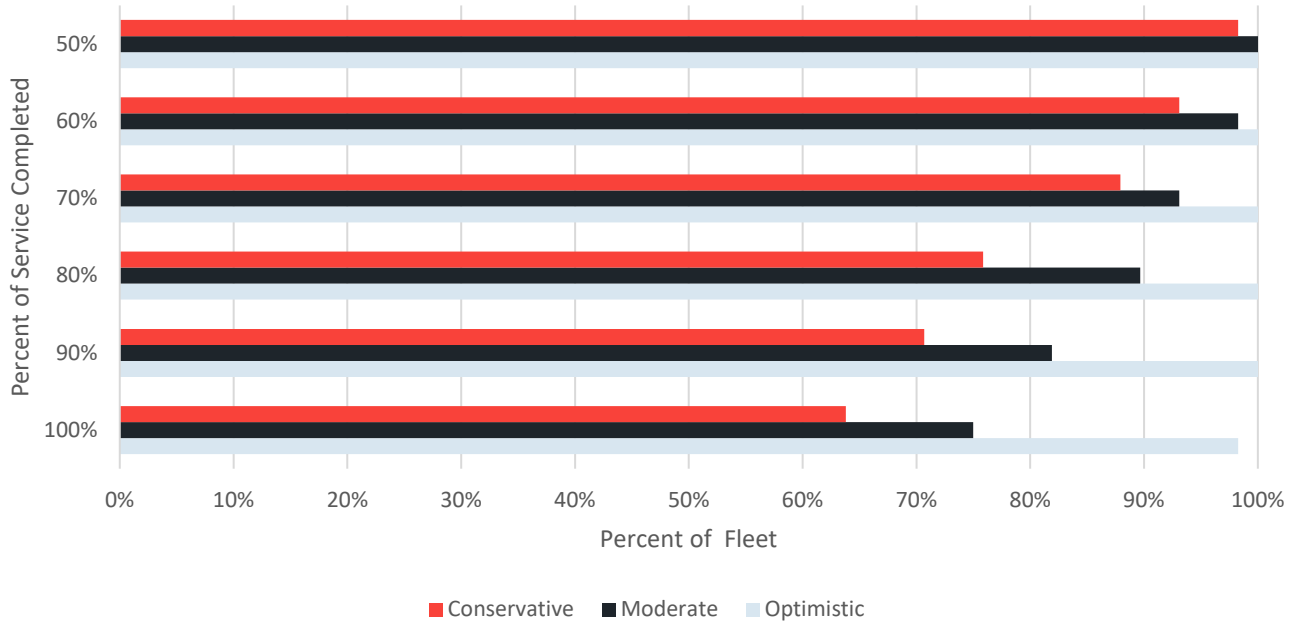
A comprehensive list of failed blocks and the percent block completion can be found in Appendix B: Failed Service Blocks.

Table 5-3. Summary of Failed Blocks at Islais Creek Yard

Sensitivity	Blocks Failed	Percent Failed
Optimistic	2	2%
Moderate	29	25%
Conservative	42	36%

Source: WSP

Figure 5-4. Percent of Service Requirements Completed for the Islais Creek Yard Fleet

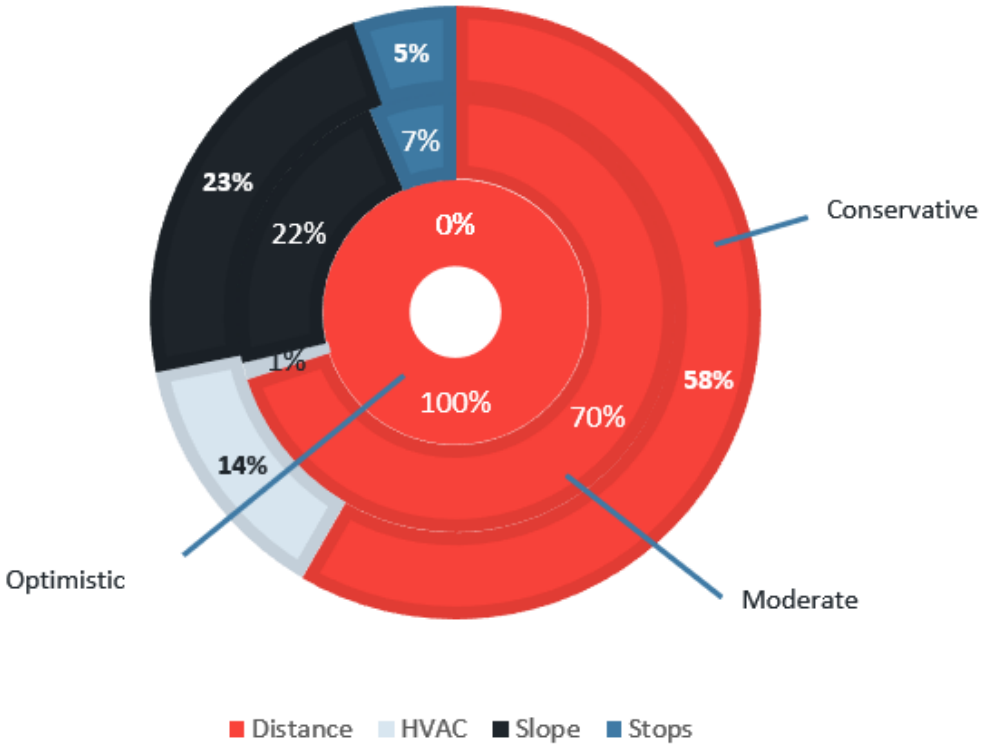


Source: WSP

5.2.2 *BLOCK ENERGY CONSUMPTION*

Figure 5-5 identifies the percent energy consumption from distance traveled, HVAC, number of stops, and slope for each sensitivity range. Slope in this service area has a considerable effect on BEB energy consumption, drawing 22% and 23% of the battery's available capacity for moderate and conservative efficiencies, respectively. The greatest shift in energy consumption distribution between sensitivity ranges is the impact of HVAC. Under the moderate sensitivity range (reflecting a fair-weather day), HVAC has only a 1% influence on energy consumption. When assuming the most extreme climate conditions in the San Francisco, however, HVAC may be expected to draw up to 14% of the battery's available energy. Though the region will rarely experience sustained temperatures at the annual high and low, this impact should be considered, especially in the event that climate change creates a notable effect on regional climate.

Figure 5-5. Percent of Energy Used by Consumption Factors at Islais Creek Yard



Source: WSP

5.2.3 *FLEET REQUIREMENTS*

Based on the energy required for each of the 116 service blocks operating out of Islais Creek Yard, the fleet size would need to increase by 29 to 44 buses to meet service requirements under moderate and conservative estimations, respectively (Table 5-4). The vehicle replacement ratio under moderate and conservative estimations (without service changes or technology advancements) is 1.26 to 1.38 BEBs to every one conventional bus (Table 5-5). This report recommends strategic transition phasing to allow the technology to advance or optimized service adjustments to minimize increases to the replacement ratio.

Table 5-4. Islais Creek Yard Vehicles Required

Sensitivity	40' Vehicles	60' Vehicles	Total Vehicles	Net Increase from Existing
Optimistic	1	117	118	2
Moderate	1	144	145	29
Conservative	1	159	160	44

Source: WSP

Table 5-5. Islais Creek Yard Vehicle Replacement Ratio

Sensitivity	40’ Vehicles	60’ Vehicles	Total Vehicles
Optimistic	1:1	1:1.02	1:02
Moderate	1:1	1:1.26	1:1.26
Conservative	1:1	1:1.39	1:38

Source: WSP

5.3 POWER NEEDS

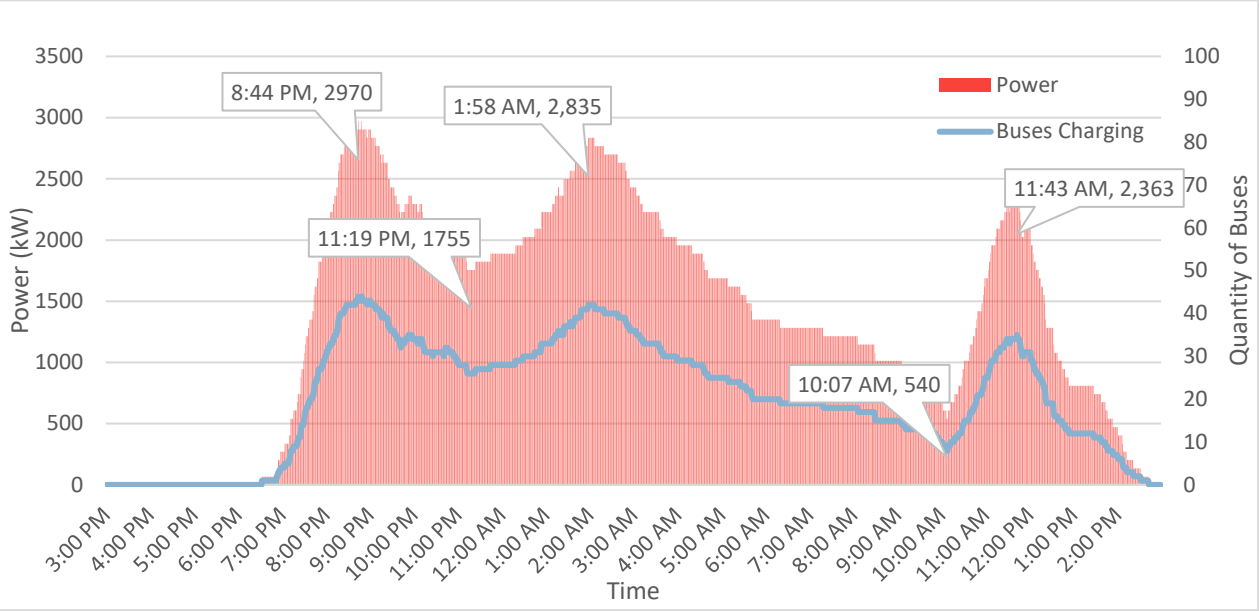
The following section presents current and future energy needs based on various charging ratios and resiliency strategies at Islais Creek Yard.

5.3.1 *CURRENT AND FUTURE SERVICE*

From the BEB service modeling, WSP was able to simulate the energy consumption for the current fleet parameters assuming that the chargers will split power to each bus to allow concurrent charging at an average rate 67.5 kW for a 1:2 ratio. This takes into consideration battery buffer, efficiency, and pull-in servicing, as previously defined in Section 2.1. Figure 5-6 shows an incline in demand as buses begin charging at 7:00 PM. The demand first peaks at 8:44 PM and drops slightly through 11:19 PM where it again increases to reach a lesser peak demand at 1:58 AM. Buses continue to charge throughout the morning period reaching the lowest point at 10:00 AM. The demand never reaches zero and begins to increase again when buses return after morning service. The smaller demand curve occurs from 10:00 AM and ends at 2:40 PM where there is a break in charging until buses return in the evening from daily service.

The power shown in Figure 5-6 is used to determine the monthly and annual energy in kWh, as well as the average and peak demand in kW which are summarized in Table 5-6.

Figure 5-6. Islais Creek Yard – Energy Consumption



Source: Jacobs

Electrifying the current fleet at Islais Creek Yard of 115 BEBs will consume 1,407,007 kWh a month and 16,884,087 kWh annually, with an average demand of 1,361 kW and a peak demand of 2,970 kW. This yard will be electrifying the current fleet size of 115 BEB's without an increase in 2040 projections.

The current energy needs at Islais Creek can be supported by a new service from nearby 12 kV circuits based on the available capacity provided from PG&E. Referring to Table 5-7, the two nearby circuits, Potrero 1105 and Potrero 1103 are viable options with available circuit capacity. Current and future service energy needs are provided in Table 5-6.

Table 5-6. Islais Creek Yard Energy Consumption

Islais Creek Yard Energy Consumption	BEB Fleet Size	Average Demand (kW)	Peak Demand (kW)	Monthly Energy Consumption (kWh)	Annual Energy Consumption (kWh)
Current Fleet	115	1,361	2,970	1,095,388	13,144,658
Future Size	115	1,361	2,970	1,095,388	13,144,658

Source: Jacobs

5.3.2 *RESILIENCY*

Islais Creek Yard currently has a 750 kW standby generator with a 1,600A breaker. There is also a photovoltaic system that provides power through the inverter distribution panel, which is rated 600A at 480V. It is assumed that this generator will only be used to power the building and will not charge buses during an emergency.

In 2040, it is estimated that 115 buses will be stored at Islais Creek Yard. For emergency response, Islais Creek Yard is expected to maintain enough auxiliary power to charge a minimum of 10% of the buses stored at the Yard. This would require 12 buses to be available during an unexpected loss of power.

The Islais Creek Yard design recommendations include two 2,000 kWh (4,000 kWh total) of onsite battery storage to provide energy to charge buses during power outages. At an estimated discharge rate of C/4 (i.e. one-fourth of total battery capacity can be discharged per hour), approximately 1,000 kW of battery power will be available for a continuous four-hour period. Assuming 30-foot and 60-foot buses (with a 172 kWh and 458 kWh usable battery capacity) are charged at 135 kW, this would provide enough energy to fully charge eight buses from 0% to 100%. Realistically, assuming that all buses are stored with 25% of their total capacity, the reserve systems would be able to charge 11 buses up to 100% (approximately 9.5% of the fleet stored at Islais Creek Yard).

To charge a fleet of 12 buses (from 25% to 100%) for emergency response, an additional 89 kWh of auxiliary battery storage would need to be installed on the premises. This would result in a total of 4,089 kWh that would be able to fully charge emergency response buses within a four-hour period.

Islais Creek Yard is expected to use 629 kW solar panels to charge the onsite battery storage. It is estimated that the solar panels will generate an average of 2,600 kWh on a daily basis.

Islais Creek Yard is located in San Francisco's city sea level rise vulnerability zone, which may require the installation of these backup power systems to be placed on an elevated platform. This would reduce the operational risk during periods of flooding and/or rise of sea level during the useful life of the battery systems.

5.4 COSTS

Cost information at Islais Creek Yard for the battery electric bus charging equipment, on-site electrical infrastructure, utility modifications, and facility upgrades have been developed based on the concepts contained in this report. The estimated costs are $23.3 million for BEB infrastructure and $8.2 million for yard enhancements, resulting in a total direct construction cost of $31.4 million. Construction markups are applied cumulatively to the

direction construction cost to arrive at an estimated construction cost of $65.5 million. Project markups are then applied to the estimated construction cost to arrive at the Estimated Project Capital Cost of $101.5 million. Detailed cost estimates will be found in Task 3.

5.5 RECOMMENDATIONS

The following section provides recommendation for transitioning the fleet at Islais Creek Yard to 100% BEB.

5.5.1 *FLEET AND OPERATIONS*

All of the service block failures out of the Islais Creek Yard fleet are operated by 60-foot buses, which are currently offered by few manufacturers and do not perform as well as 40-foot buses. Significant advancement in 60-foot BEB capabilities are expected in the near future, however, the transition of 20% to 30% of the Islais Creek Yard fleet may need to be delayed until later in the transition goal period as the technology improves. To meet service needs, the SFMTA may also consider modifications to service scheduling or on-route charging.

5.5.2 *ELECTRICAL ENHANCEMENTS*

As previously mentioned, there is approximately 4.85 MW of available capacity on the Potrero 1105 circuit that currently feeds the yard which can support the BEB peak demand of 2.97 MW.

Additionally, the nearby 12 kV POTRERO PP (AA) 1103 circuit has a capacity of 8.4 MW with a peak load of 4.5 MW, leaving approximately 3.9 MW of additional capacity. The nearby circuit may be a factor in providing additional power to Islais Creek Yard. Pending confirmation with SFPUC and PG&E, a new interconnection to feed the yard is recommended to support the BEB fleet. For reference Table 5-6 provides the peak demand and energy consumption for Islais Creek Yard and Figure 5-7 and Table 5-7 provide information on nearby circuits. PG&E's infrastructure will need to be assessed, including the cost of possible upgrades and confirmation of the available capacity to select exactly which circuit will feed the yard.

Figure 5-7. Islais Creek Yard – Nearby Circuits

Source: PG&E

Table 5-7. Islais Creek Yard – Nearby Circuits Summary

Circuit Name	Voltage	Circuit Capacity (MW)	Circuit Max Load (MW)	Substation Bank Capacity (MW)	Substation Bank Max Load (MW)	Available Circuit Capacity (MW)	Available Bank Capacity (MW)
POTRERO PP (A) 1105	12 kV	9.99	5.14	74.3	46.68	4.85	27.62
POTRERO PP (A) 1103	12 kV	8.42	4.52	74.3	43.36	3.9	30.94

Source: PG&E
Note: POTRERO PP (A) 1105 is Islais Creek Yard's existing circuit. PG&E to verify.

5.5.3 *FACILITIES*

The Islais Creek Yard will be capable of storing 153 total BEBs, of which, 149 can be charged simultaneously. 145 buses can be charged with pantographs via an overhead supporting structure that spans the area of the existing parking tracks. An additional four buses can be charged in the maintenance bays via plug-in dispensers.

Table 5-8 summarizes the ZEB infrastructure planned at Islais Creek Yard.

Table 5-8. Islais Creek Yard ZEB Infrastructure Summary

Primary Charging Strategy	Overhead Inverted Pantograph
No. of Existing Buses (September 2020)	115
No. of Charging Cabinets	75
No. of Dispensers/Charging Positions	149

Source: WSP
Note: It is assumed that one charger will provide power for two charging positions/buses/dispensers (1:2 ratio)

The following BEB equipment and locations are proposed:

- 73 DC charging cabinets located on a platform attached to the overhead support structure spanning a portion of the bus storage tracks and terminating at the edge of the overhead I-280 offset limits. These charging cabinets will distribute to 145 pantograph-charging positions over the existing main storage tracks with a gap in charging positions under I-280 for storing spare buses. The charging positions begin again in the parking area west of I-280's offset limits.
- The overhead support structure columns are to be placed every three to four tracks. These columns will also provide the support for the overhead mounted pantographs.
- Two charging cabinets and four dispensers located in the maintenance building (with four dispensers) will charge the eight remaining spare buses that cannot be charged in the main parking area.

The pantographs and charging cabinets will be served by the following electrical infrastructure:

- Two interrupter switch pairs and two meters will be installed in the existing electrical yard. The first interrupter in each pair will be owned and operated by PG&E, and the second interrupter in each pair and both meters will be owned by SFPUC. Power will be distributed from the meter up along the fuel and wash building before crossing to the platform to the medium-voltage switchgear.
- One medium-voltage switchgears and two medium- to low-voltage transformers with corresponding low-voltage switchgear will be installed on the platform, above the bus parking area. The switchgear and transformers will be rated for exterior use.
- Each 3,325 kVA transformer can feed a maximum of 20 charging cabinets charging at 150 kW or 40 pantographs charging at 75 kW rate. This calculation is based on maximum AC input rating of 200A at 480V 3 phase, or 166 kVA, for each charging cabinet and is equal to dividing 3,325 kVA by 166 KVA value. See Table 5-9 for the number of charging cabinets connected to other transformer based on the assumption that two or more pantographs are fed by one charging cabinet.

Table 5-9. Transformer Size Requirements

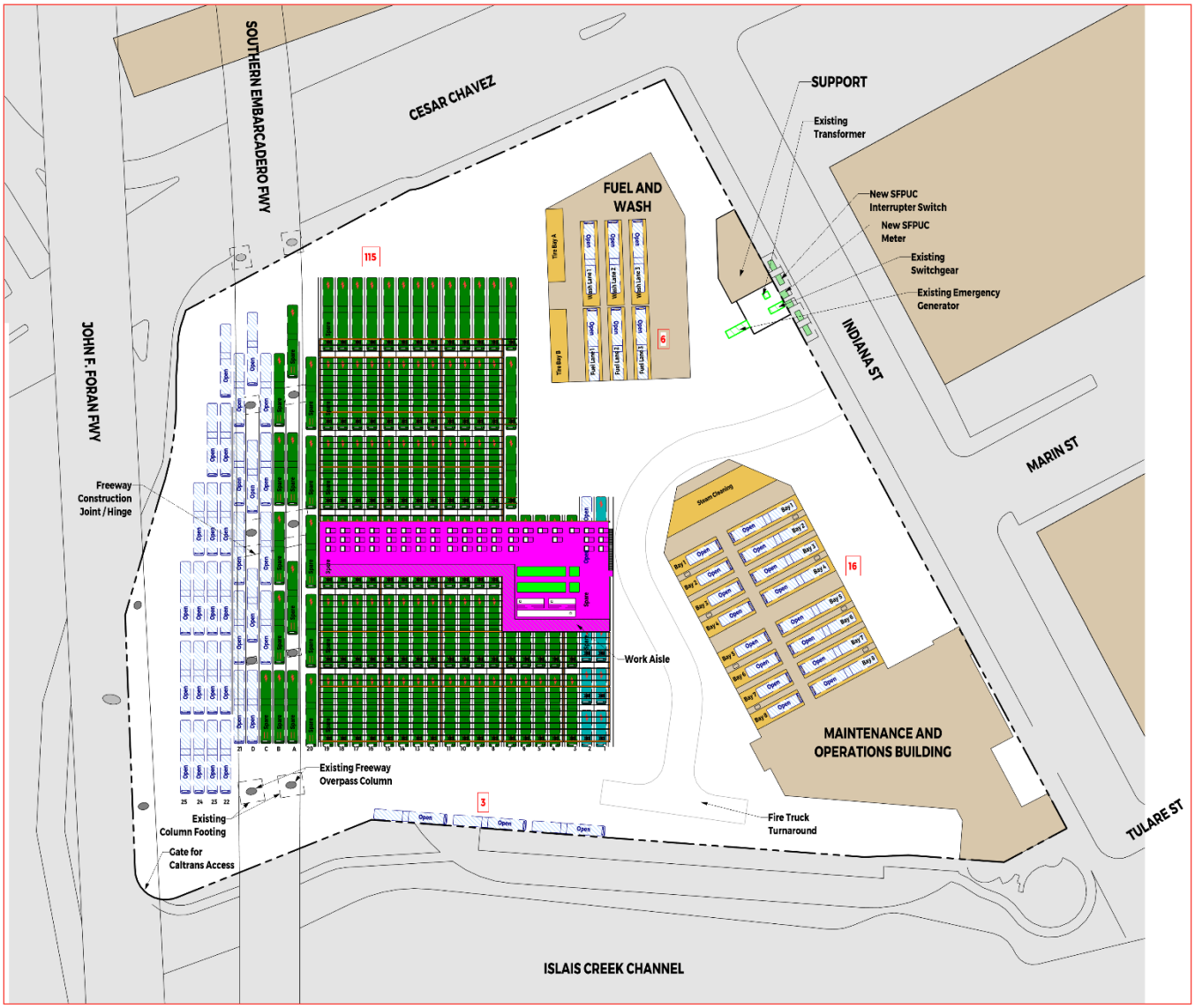
Transformer Size	Charging Cabinets	Dispensers at 1:2 ratio (Concurrent Charging)
Transformer 1: 3,325 kVA	20	40
Transformer 2: 3,325 kVA	20	40
Transformer 3: 3,320 kVA	20	20
Transformer 4: 2,500 kVA	15	30
Total	**75**	**150**

Source: WSP

While not all EVSE will be in use at once based on the facility modeling tool, the feeder can be sized for a load that is managed by an automatic load management system, but each 480V Transformer must be sized assuming its full connected load can be handled.

Figure 5-8 illustrates the Islais Creek yard at full build-out, in which green buses represent 60-foot BEBs, and yellow buses represent 40-foot BEBs.

Figure 5-8. Islais Creek Yard – Full ZEB Build-Out



Source: WSP

5.5.4 *FACILITIES STAGING*

As discussed, the specific staging for each yard is still being analyzed, with detailed staging and phasing to be included in Task 3. The following section provides an overview of the proposed improvements in Stage 1, along with a conceptual framework for subsequent stages. Figure 5-9 demonstrates a draft staging plan, illustrating which sections of the yard will be impacted by each stage.

STAGE 1

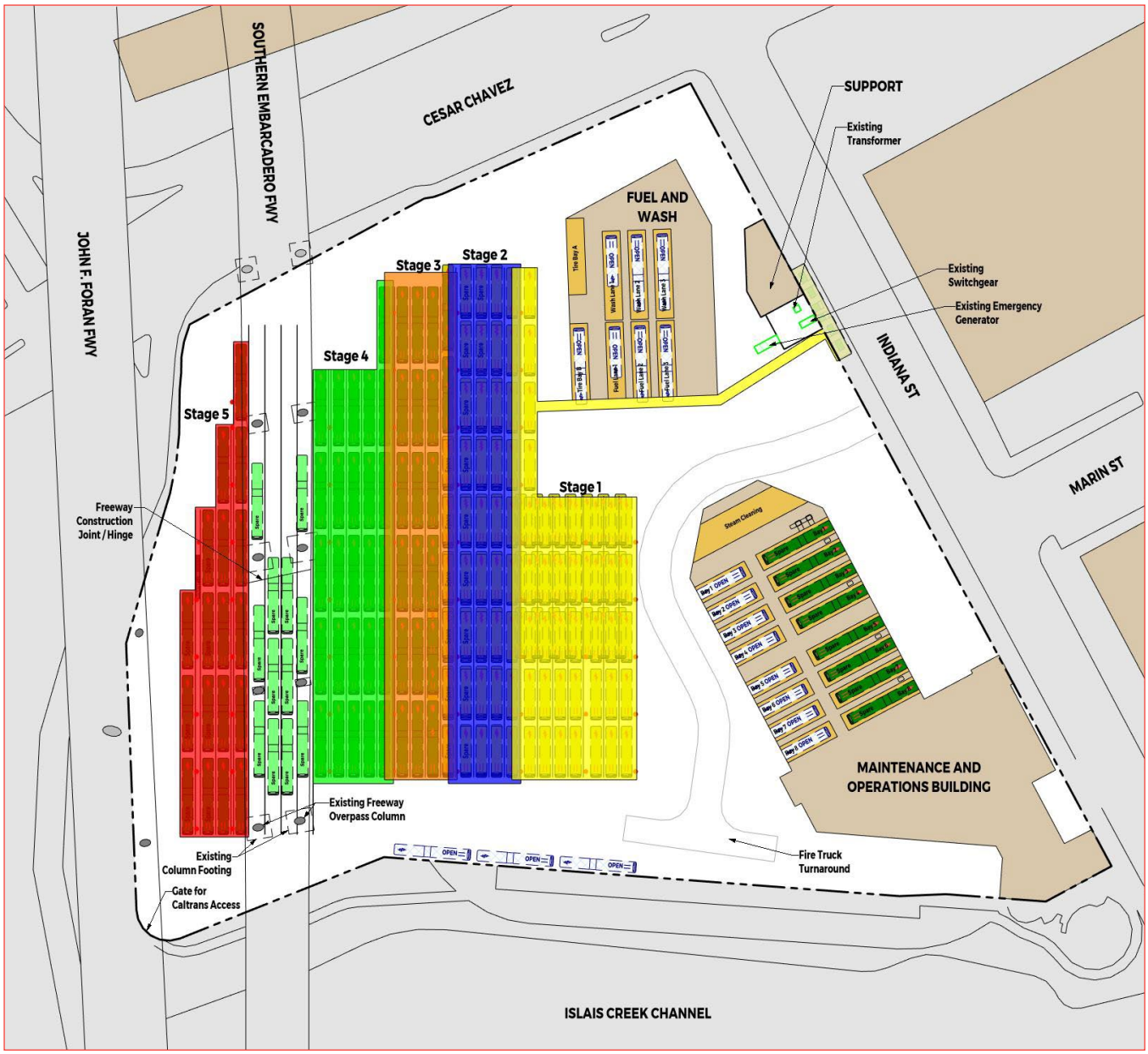
The recommended first stage for the Islais Creek Yard involves the installation of the four interrupter switches and two meters in the existing electrical yard and the routing of utility-provided power into the facility to the site's new transformers. Conduit and routing from the utility should be sized to serve the yard's full fleet. Stage 1 will

also include the construction of the overhead support structure with distribution conduit, transformers and switchgears, pantographs, and charging cabinets to serve the easternmost seven tracks of bus parking.

FUTURE STAGES

Each subsequent stage of deployment will be accomplished by adding a similar modular overhead support structure and the required charging infrastructure to support the number of buses to be charged in the stage. The breakdown of this staging will follow the SFMTA's growth plans and prioritization schedule.

Figure 5-9. Islais Creek Yard Staging Plan



Source: WSP

Attachment 5

Waterfront Resilience Program

Draft Waterfront Adaptation Strategies

Frequently Asked Questions

What are Draft Adaptation Strategies?

Adaptation Strategies are different ways for the City to create a resilient, sustainable, and equitable waterfront for the next 100 years. They are a combination of construction projects and policy changes that will guide decisions about:

- Where, when, and how high to build flood defenses
- How and when to adapt key buildings and infrastructure to ensure continued operations of City services
- How to incorporate nature-based and ecological features
- And recommendations for policy changes that will reduce risk to public and private lands, preserve housing and jobs, and create recreational opportunities, waterfront access, and improved Bay habitat

There is no single approach to adaptation that will meet the needs of San Francisco along the entire waterfront. The different risks, topography, and historic development of the waterfront means that we will need to use a combination of approaches.

Who was involved in developing them?

The development of Draft Strategies reflects five-plus years of citywide community engagement that has connected with tens of thousands of San Franciscans on what a resilient, sustainable, equitable waterfront means to them. You can read more about community feedback here.

A citywide survey conducted in Summer of 2022 with nearly 1,000 responses and over 3,000 comments recorded showed an openness to exploring the many types of adaptation approaches (including more transformative options) and a desire to explore where each would work best along San Francisco's shoreline. Additional feedback included the importance of preserving and expanding the connection between the city and the waterfront, and planning with a focus on the feasibility, cost, and disruption impacts of the draft strategies.

What is and isn't decided through the process of arriving at a Draft Waterfront Adaptation Plan?

The Draft Waterfront Adaptation Strategies are options to be evaluated that reduce flood and seismic risk along the waterfront. The Draft Strategies show a wide range of possibilities, with different impacts and benefits. We will choose the best ideas from all of them to create a Draft Waterfront Adaptation Plan (Tentatively Selected Plan or Draft Plan) by summer 2023.

What are engagement opportunities for the public to weigh in?

The Port is committed to robust engagement around the draft Adaptation Strategies. Draft Waterfront Adaptation Strategies are ready for public engagement now and the Port will be gathering feedback on these now through early 2023. The Port will host a range of engagement opportunities for opportunities for public

engagement on the Draft Strategies, including community meetings, walking tours, open houses, focus groups, and a digital engagement tool.

What are the costs associated with each strategy?

All of these strategies will cost tens of billions of dollars. The U.S. Army Corps of Engineers will prepare cost estimates as part of a next phase of the project. These cost estimates will help make decisions about which strategies to pursue in which areas.

How will the Embarcadero Piers be adapted to sea level rise?

The Port is in the process of studying different approaches to adapting the piers to sea level rise over time, in an effort to balance their integrity as historic resources, their economic and functional utility, and their useful lifespan. These studies will consider pier adaptation in relation to the adaptation strategies presented here, and will be the subject of future public engagement.

What is the Port's approach to equity?

Sea Level Rise impacts will have a disproportionate impact on historically marginalized neighborhoods. For example, an SF Planning Department study found that by 2050, census tracts impacted by sea level rise have 12.7% African American residents as opposed to 5.2% for the city as a whole. (That is, black residents are significantly overrepresented in areas vulnerable to mid-century sea level rise.)

The effects of climate change and sea level rise will not be felt by all people equally. Even in cases where flooding is comparable, existing social and economic conditions, as well as potential contamination burdens, will influence how severe the disruption will be across households.

The WRP is developing a Racial and Social Equity Assessment that serves as the starting point in support of the Port's 2020 Racial Equity Action Plan (REAP). An evaluation framework was developed for measuring equity outcomes in internal and external-facing equity strategies. For example, the framework seeks to ensure Draft Strategies developed create opportunities for San Francisco's Equity Priority Communities to benefit directly, both through job opportunities and post construction conditions.

What are the job opportunities that will be made available for local people?

Construction of Embarcadero Early Projects and Southern Waterfront Projects will create job opportunities for many residents with opportunities estimated to begin in 2024. Port partners are working with trade unions, their respective apprenticeship programs, the Office of Economic and Workforce Development (City Build), community-based organizations, training providers and educational institutions to connect San Francisco youth and adults with work readiness, apprenticeship, job training, and employment. There will be a range of opportunity across the 26 Building Trades as well as career opportunities in facility operations.

How will the Waterfront Resilience Program support local small businesses?

The Waterfront Resilience Program will create professional services as well as construction opportunities for local businesses. Services include design and engineering (civil, electrical, and mechanical) support and project management, and in construction areas such as roadway work, signage, fencing, site clean-up and waste management, excavation, hauling and disposal, concrete work, demolition, carpentry, and trucking. The Port is committed to supporting local businesses which boost new employment opportunities and serve our communities.

What is the City doing to address sea level rise in areas outside of the Port's jurisdiction?

While the Port's jurisdiction encompasses 7.5 miles of shoreline from Heron's Head Park to Fisherman's Wharf, the City of San Francisco is working on advancing resilience planning and developing projects across the City's entire shoreline:

- Approved development projects such as the Candlestick Point/Hunters Point Shipyard and the India Basin mixed-use development incorporate sea level rise adaptation.

- In Candlestick Point/Hunters Point Shipyard, the approved development plans incorporate sea level rise adaptation.
- Other public projects such as the Ocean Beach Climate Change Adaptation Project (led by SFPUC) and 900 Innes/India Basin Shoreline Park (led by RPD) are also adapting portions of the City's shoreline to sea level rise and other climate hazards.

What is being done in the Southern Waterfront about flooding and contamination containment?

A recent San Francisco Civil Grand Jury report investigated the impact of sea level rise and ground water levels in Hunter's Point Shipyard. The City has been aware of issues related to the clean-up of the former base as a condition for development for several decades. The City is carefully considering the recommendations from the report, including looking at the entire future hydrological cycle, Bay/sea level rise and coastal flooding, future extreme precipitation, and groundwater rise. This includes seeking funding for additional studies such as analysis of known contaminated sites and the potential for rising groundwater to mobilize contaminants.

Why is the "retreat" approach (over-time moving some buildings and infrastructure out of the highest risk areas) suggested in the Southern Waterfront but not along the Embarcadero?

The geographic conditions of the Southern Waterfront, primarily the presence of creeks, requires that we manage the combined stormwater and coastal flood water differently than along the Embarcadero waterfront. Unlike Downtown, the low-lying filled areas around Islais Creek / Bayview and Mission Creek / Mission Bay are the first to flood, are more susceptible to settlement, are seismically unstable, and contain contaminants that may migrate when flooded. The Embarcadero has a higher density of buildings and infrastructure and is built right up to the waterfront edge. Additionally, very large, buried infrastructure, like rail lines and sewer infrastructure, is located in the Embarcadero, which would be very costly to relocate. Managed "retreat" over many decades in the southern waterfront gives us time to gradually adapt the shorelines and align with the natural watersheds to enable a more natural, passive (e.g. fewer pumps and walls) and resilient approach to flood risk.

How can buildings and infrastructure be adapted to allow water in (called "accommodation")?

"Accommodation" of water could mean many different things. Some examples are floodproofing or elevating buildings or raising the ground floor of buildings. Sensitive equipment can be located on roofs instead of basements. Floodwalls can be added to the perimeter of properties or buildings. Backups can be created for infrastructure and services (power, sewer, transportation) that will be periodically affected by flooding. Early warning and communication systems can be used to alert people to flooding. Deployable barriers can be implemented as storms, waves, or high tides approach.

If buildings are adequately adapted, they would not require displacement. Because they would be in a designated flood zone, they would likely be required to carry flood insurance, and may have access and other

building challenges. Surrounding infrastructure such as roads and utilities would also have to be adapted to serve the buildings.

How will the Port address concerns about bay fill and bay ecology?

Bay Area policies about filling the Bay date from the mid-20th century when the Bay was being filled rapidly to make new land, without regard to the environmental consequences. Since 1965, stringent policies limit filling the Bay to protect this important environment. The Port has convened a Resource and Regulatory Agency Working Group to gain input and understand regulatory constraints and opportunities.

Today, sea level rise presents new challenges as rising water levels expand the Bay and create flood risk. It may be necessary or preferable to do some bay fill in limited areas to address that risk. It remains to be seen how policies governing these activities may shift in this new context.

With respect to the Bay's ecology, the Port is developing principles for engineering with nature, and has convened an Engineering with Nature Working Group made up of local, regional, national, and international experts. Nature-based features will be incorporated into the Draft Waterfront Adaptation Plan wherever possible.

Attachment 7

U.S. SENATOR DIANNE FEINSTEIN
CALIFORNIA

COMMITTEE ON THE JUDICIARY
- CHAIR, HUMAN RIGHTS AND THE LAW
SELECT COMMITTEE ON INTELLIGENCE
COMMITTEE ON APPROPRIATIONS
- CHAIR, ENERGY AND WATER SUBCOMMITTEE
COMMITTEE ON RULES AND ADMINISTRATION

United States Senate

April 13, 2023

The Honorable Pete Buttigieg
Secretary of Transportation
Attn: Office of Infrastructure Finance and Innovation
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Secretary Buttigieg:

I write in support of the San Francisco Municipal Transportation Agency's (SFMTA) grant applications under the Buses and Bus Facilities and Low or No Emissions programs. SFMTA is seeking grant funding to help support its efforts to rehabilitate and transform three bus yards to better serves the agency's climate, safety, and transit reliability goals.

SFMTA is requesting a total of $93,308,079 to ensure San Francisco's transit system has the necessary infrastructure to operate efficiently and reliably for years to come. The first project, the rehabilitation of the Kirkland Bus Yard, will allow for the development of a modern, state-of-the-art transit maintenance facility for SFMTA's low-emission hybrid motor coaches. The second project will install electric vehicle infrastructure, including charging stations, at two additional bus yards. The Woods and Islais Creek bus yards currently lack the infrastructure to help SFMTA meet local and state zero-emission fleet mandates. The project will improve SFMTA's ability to provide consistent transit service in San Francisco by improving maintenance infrastructure and advancing San Francisco's climate goals.

By investing in these critical upgrades, SFMTA will be able to better serve the communities nearby the three bus yards and the City of San Francisco at large. Thank you for your attention to this important request, and I urge you to give this application your full consideration. If you have any questions, please do not hesitate to contact my San Francisco Office at 415-393-0707.

Sincerely,

Dianne Feinstein
United States Senator

WASHINGTON, DC 20510-0504
http://feinstein.senate.gov

ALEX PADILLA
CALIFORNIA

(202) 224-3553
PADILLA.SENATE.GOV

United States Senate
WASHINGTON, DC 20510

COMMITTEES:
BUDGET
ENVIRONMENT AND PUBLIC WORKS
HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS
JUDICIARY
RULES AND ADMINISTRATION

April 7, 2023

The Honorable Nuria Fernandez
Administrator
Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

RE: Support for SFMTA Buses & Bus Facilities & Low or No Emission Grant Program Applications

Dear Administrator Fernandez:

I write in support of San Francisco Municipal Transportation Agency's (SFMTA) applications for funding through the Buses & Bus Facilities and Low or No Emission Grant Programs. The requested funding would help SFMTA meet the guidelines of San Francisco's Climate Action Plan as well as the requirements of the California Air Resources Board's Innovative Clean Transit Regulation.

The SFMTA motor coach fleet consists of 585 30-foot, 40-foot, and 60-foot articulated diesel hybrid vehicles based and maintained at multiple facilities throughout San Francisco. SFMTA is committed to electrifying its bus fleet, but significant investment is needed to upgrade the power supply and rehabilitate or the agency's bus facilities before procuring and operating electric vehicles.

SFMTA is submitting applications for two projects: one to fund rehabilitation of an obsolete bus maintenance facility and one to prepare two facilities for transition to battery electric buses. The first project would fund the rehabilitation of the Kirkland Bus Yard, where 91 low-emission 40-foot diesel hybrid motor coaches are serviced. Located in an urban historically disadvantaged community at the northern edge of San Francisco, the Kirkland facility is over 73 years old. These updates are critical to the large transit dependent population living in San Francisco.

The second project would fund the installation of EV infrastructure—including charging stations, inverted pantographs and structural platforms—at the Islais Creek and Woods bus yards. The Woods Bus Yard services 40' diesel hybrid coaches and the Islais Creek Yard, located in an Historically Disadvantaged Community, services 60' articulated coaches. The requested funding would support SFMTA in meeting both local and state mandates to transition to a zero-emission transit system.

I urge your full and fair consideration of SFMTA's application consistent with all applicable laws, rules, and regulations. Please keep my office informed of the status of this application, and if I can be of further assistance, please contact my Deputy State Director, Daniel Chen, at (650) 533-2207. Thank you for your consideration.

Respectfully submitted,

ALEX PADILLA
United States Senator

April 10, 2023

Ms. Nuria I. Fernandez
Administrator Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Re: SFMTA Applications for FY 2023 Buses and Bus Facilities, and Low or No Emission Grants

Dear Administrator Fernandez,

I am writing to express my strong support for the San Francisco Municipal Transportation Agency's (SFMTA) applications for funding through the Buses and Bus Facilities, and Low or No Emission Grant Programs. Federal funding is critical to the SFMTA's ability to achieve the goals of San Francisco's Climate Action Plan and the requirements of the California Air Resources Board's Innovative Clean Transit Regulation.

As a city, San Francisco is committed to electrifying our bus fleet. However, significant investment is needed to upgrade the power supply and rehabilitate the agency's aged bus facilities before we can buy and operate electric buses. This transition will be phased, with multiple facilities being upgraded over the next 15 to 20 years. To support this effort, the SFMTA is submitting applications for two projects, one to fund rehabilitation of obsolete bus maintenance facility, the Kirkland Bus Yard, and the second to prepare two facilities, Islais Creek and Woods, for transition to Battery Electric Buses.

Located in an urban, Historically Disadvantaged Community at the northern edge of San Francisco, the Kirkland facility is more than 73 years old. This funding would rehabilitate and upgrade Kirkland's utilities, buildings, and pavement so the facility can better service hybrid buses and provide reliable transit service for the people who live and work in the city.

The second application is to fund the installation of electric vehicle infrastructure at two bus yards, Woods Facility and the Islais Creek facility, located in a Historically Disadvantaged Community. The infrastructure will include charging stations, inverted pantographs and structural platforms. Federal funding will allow the SFMTA to begin to meet both local and state mandates to transition to a zero-emission transit system.

I urge you to consider these applications and support the SFMTA's continued progress towards meeting its growing ridership demand, and achieving an energy-efficient and environmentally sustainable transportation system.

Sincerely,

London N. Breed
Mayor

Member, Board of Supervisors
District 10

City and County of San Francisco

SHAMANN WALTON
華頌善

April 10, 2023

Ms. Nuria I. Fernandez, Administrator
Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Re: SFMTA Applications for FY 2023 Buses & Bus Facilities and Low or No Emission Grants

Dear Administrator Fernandez,

I am writing to express my strong support for the San Francisco Municipal Transportation Agency's (SFMTA) applications for funding through the Buses & Bus Facilities and Low or No Emission Grant Programs. Federal funding is critical to the SFMTA's ability to achieve the goals of San Francisco's Climate Action Plan and the requirements of the California Air Resources Board's (CARB) Innovative Clean Transit Regulation (ICT).

The SFMTA Muni motorcoach fleet consists of 585 30-foot, 40-foot and 60-foot articulated diesel hybrid vehicles based and maintained at multiple facilities throughout San Francisco. The SFMTA is committed to electrifying its bus fleet, however significant investment is needed to upgrade the power supply and rehabilitate or replace the agency's aged and obsolete bus facilities before procuring and operating electric vehicles. This transition will be phased, with multiple facilities being upgraded over the next 15 to 20 years.

The SFMTA is submitting applications for two projects, one to fund rehabilitation of an obsolete bus maintenance facility and the second, to prepare two facilities for transition to Battery Electric Buses (BEB).

One application is to fund the rehabilitation of the Kirkland Bus Yard, where 91 low-emission 40' diesel hybrid motorcoaches are serviced. Located in an urban Historically Disadvantaged Community at the northern edge of San Francisco, the Kirkland facility is over 73 years old. Upgrading its aged utilities, buildings and pavement is critical to continuing to provide reliable transit service, especially to the large transit dependent population living in San Francisco.

The second application is to fund the installation of EV infrastructure, including charging stations, inverted pantographs and structural platforms, at two bus yards, Islais Creek and Woods. The Woods Bus Yard services 40' diesel hybrid coaches and the Islais Creek Yard,

City Hall • 1 Dr. Carlton B. Goodlett Place • Room 244 • San Francisco, California 94102-4689 • (415) 554-7670
Fax (415) 554-7674 • TDD/TTY (415) 554-5227 • E-mail: Shamann.Walton@sfgov.org

located in an Historically Disadvantaged Community, services 60' articulated coaches. Federal funding will allow the SFMTA to begin to meet both local and state mandates to transition to a zero-emission transit system.

I urge you to consider these applications and support the SFMTA's continued progress towards meeting its growing ridership demand, especially for the transit-dependent, and achieving an energy-efficient and environmentally sustainable transportation system.

Sincerely,

District 10 Supervisor
San Francisco Board of Supervisors

City Hall • 1 Dr. Carlton B. Goodlett Place • Room 244 • San Francisco, California 94102-4689 • (415) 554-7670
Fax (415) 554-7674 • TDD/TTY (415) 554-5227 • E-mail: Shamann.Walton@sfgov.org

City and County of San Francisco

President, Board of Supervisors

AARON PESKIN

April 12, 2023

Ms. Nuria I. Fernandez,
Administrator Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

Re: **SFMTA Applications for FY 2023 Buses & Bus Facilities and Low or No Emission Grants**

Dear Administrator Fernandez,

I am pleased to support the San Francisco Municipal Transportation Agency's (SFMTA) applications for funding through the Buses & Bus Facilities and Low or No Emission Grant Programs. Federal funding is critical to the SFMTA's ability to achieve the goals of San Francisco's Climate Action Plan and the requirements of the California Air Resources Board's (CARB) Innovative Clean Transit Regulation (ICT). The project also reflects years of planning and strategizing improvements to our transportation system focusing on achieving low emission.

The SFMTA Muni motorcoach fleet consists of 585 30-foot, 40-foot and 60-foot articulated diesel hybrid vehicles based and maintained at multiple facilities throughout San Francisco. The SFMTA is committed to electrifying its bus fleet, however significant investment is needed to upgrade the power supply and rehabilitate or replace the agency's aged and obsolete bus facilities before procuring and operating electric vehicles. This transition will be phased, with multiple facilities being upgraded over the next 15 to 20 years.

The SFMTA is submitting applications for two projects, one to fund rehabilitation of an obsolete bus maintenance facility and the second, to prepare two facilities for transition to Battery Electric Buses (BEB).

One application is to fund the rehabilitation of the Kirkland Bus Yard, where 91 low-emission 40' diesel hybrid motor coaches are serviced. Located in an urban Historically Disadvantaged Community at the northern edge of San Francisco, the Kirkland facility is over 73 years old. Upgrading its aged utilities, buildings and pavement is critical to continuing to provide reliable transit service, especially to the large transit dependent population living in San Francisco.

The second application is to fund the installation of EV infrastructure, including charging stations, inverted pantographs and structural platforms, at two bus yards, Islais

Creek and Woods. The Woods Bus Yard services 40' diesel hybrid coaches and the Islais Creek Yard, located in an Historically Disadvantaged Community, services 60' articulated coaches. Federal funding will allow the SFMTA to begin to meet both local and state mandates to transition to a zero-emission transit system.

I respectfully urge you to consider the approval of these applications and support the SFMTA's continued progress towards meeting San Francisco's plans to further implement an environmentally sustainable transportation system.

Sincerely,

Aaron Peskin

Aaron Peskin
Supervisor District 3

San Francisco Transit Riders
P.O. Box 193341, San Francisco, CA 94119
www.sftransitriders.org | info@sftransitriders.org | @SFTRU

April 6, 2023

Ms. Nuria I. Fernandez
Administrator
Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, D.C. 20590

RE: SFMTA Applications for FY 2023 Buses & Bus Facilities and Low or No Emission Grants

Dear Administrator Fernandez,

I am writing to express my strong support for the San Francisco Municipal Transportation Agency's (SFMTA) applications for funding through the Buses & Bus Facilities and Low or No Emission Grant Programs. Federal funding is critical to the SFMTA's ability to achieve the goals of San Francisco's Climate Action Plan and the requirements of the California Air Resources Board's (CARB) Innovative Clean Transit Regulation (ICT).

The SFMTA Muni motorcoach fleet consists of 585 30-foot, 40-foot and 60-foot articulated diesel hybrid vehicles based and maintained at multiple facilities throughout San Francisco. The SFMTA is committed to electrifying its bus fleet, however significant investment is needed to upgrade the power supply and rehabilitate or replace the agency's aged and obsolete bus facilities before procuring and operating electric vehicles. This transition will be phased, with multiple facilities being upgraded over the next 15 to 20 years.

The SFMTA is submitting applications for two projects, one to fund rehabilitation of an obsolete bus maintenance facility and the second, to prepare two facilities for transition to Battery Electric Buses (BEB).

One application is to fund the rehabilitation of the Kirkland Bus Yard, where 91 low-emission 40' diesel hybrid motorcoaches are serviced. Located in an urban Historically Disadvantaged Community at the northern edge of San Francisco, the Kirkland facility is over 73 years old. Upgrading its aged utilities, buildings and pavement is critical to continuing to provide reliable transit service, especially to the large transit dependent population living in San Francisco.

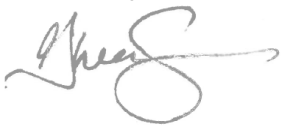
The second application is to fund the installation of EV infrastructure, including charging stations, inverted pantographs and structural platforms, at two bus yards, Islais Creek and Woods. The Woods Bus Yard services 40' diesel hybrid coaches and the Islais Creek Yard, located in an Historically Disadvantaged Community, services 60' articulated coaches. Federal funding will allow the SFMTA to begin to meet both local and state mandates to transition to a zero-emission transit system.

San Francisco Transit Riders
P.O. Box 193341, San Francisco, CA 94119
www.sftransitriders.org | info@sftransitriders.org | @SFTRU

I urge you to consider these applications and support the SFMTA's continued progress towards meeting its growing ridership demand, especially for the transit-dependent, and achieving an energy-efficient and environmentally sustainable transportation system.

Sincerely,

Thea Selby



Board Co-Chair
San Francisco Transit Riders

METROPOLITAN
TRANSPORTATION
COMMISSION

Bay Area Metro Center
375 Beale Street, Suite 800
San Francisco, CA 94105
415.778.6700
www.mtc.ca.gov

April 7, 2023

Ms. Nuria Fernandez
Administrator, Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, DC

RE: FTA Section 5339(b) Bus and Bus Facilities and 5339(c) Low- and No-Emission Bus Competitive Grant Programs – Bay Area Applications

Dear Administrator Fernandez:

The Metropolitan Transportation Commission (MTC) is the Metropolitan Planning Organization and the transportation planning, financing, and coordinating agency for the nine-county San Francisco Bay Area. Additionally, MTC is the designated recipient of certain federal transit funds for the large urbanized areas in the metropolitan planning area. Our current long-range Regional Transportation Plan (RTP) and regional Sustainable Communities Strategy, *Plan Bay Area 2050*, was adopted in October 2021.

MTC submits this letter of support for several operators who are applying for a combined total of approximately $305 million from both the Bus and Bus Facilities and the Low- and No-Emission Bus Competitive Grant Programs, as shown in the table below:

Operator	Project Title	FTA Request
AC Transit	Training and Education Center Modernization and Purchase of Fuel Cell Buses	$26,000,000
Marin Transit	Electrification and Energy Upgrades for Rush Landing Bus Facility	2,894,737
	Fixed Route Maintenance and Electric Bus Charging Facility	31,385,000
SamTrans	Emission Zero: North Base	46,900,000
SFMTA	SFMTA Battery Electric Bus Transition Program	21,600,000
	Kirkland Yard Renovation Program	80,000,000
SolTrans	SolTrans 100% Zero Emissions Local Equity Project	12,458,500
Sonoma County Transit	Twenty-One Battery-Electric Zero-Emission Buses and Related Charging Equipment	24,025,558
VTA	Chaboya Bus Depot ZEB Transition Phase 1	20,000,000
	Total Request for §5339(b) or §5339(c) Programs:	**$265,263,795**
LAVTA	LAVTA Zero-Emissions Infrastructure Transition Project	35,624,000
	Total Request for §5339(b) Program Only:	**$35,624,000**
Petaluma	Petaluma Transit FY23 Zero Emission Bus Project	3,825,000
	Total Request for §5339(c) Program Only:	**$3,825,000**

Note: some operators are finalizing request amounts or targeted programs; such changes to requests would not affect MTC support for full funding

With an ambitious 2040 state deadline for a bus fleet transition, MTC, in partnership with Bay Area transit operators, is developing a Regional Zero Emission Transit Transition Strategy (Transition Strategy). This Transition Strategy will not only support the Bay Area in meeting the region's climate goals, but will serve as a model for the rest of the country. We are poised to make the Bay Area one of the first major markets to deploy a fully zero-emission fleet, and while MTC dedicates a large portion of federal formula funds to zero-emission bus replacements, strong discretionary support is needed to make this vision a reality, especially for infrastructure.

All bus operators must reach 100% zero emission procurements by 2029. In addition to FTA Zero-Emission Fleet Transition Plans, large bus operators completed state ZEB rollout plans in 2020 and face a 50% zero-emission procurement requirement by 2026, while small operators must complete their rollout plans by summer 2023 and procurements must be 25% zero-emission by 2026. This will not be possible without significant federal support.

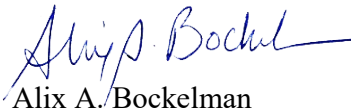
Each endorsed project for FY23 plays a role in MTC's Transition Strategy. Large operators applying include AC Transit, SFMTA, Samtrans, and VTA. In addition to bus purchases, AC Transit's grant application focuses on a crucial component of transition: workforce training. SFMTA, Samtrans, and VTA's applications all focus on outfitting their facilities with the necessary infrastructure for charging zero emission buses. The conversion of SFMTA's 72-year-old Kirkland facility to support an electric fleet is critical for the region's largest bus operator.

Small operators Soltrans, Sonoma County Transit, and Petaluma would purchase new battery-electric and fuel cell buses and associated charging equipment. LAVTA and Marin Transit focus on innovative charging facilities, which rely on discretionary funding streams like the Bus and Bus Facilities and the Low- and No-Emission Bus Competitive Grant Programs to be realized.

In addition to supporting the region's Transition Strategy, these projects are consistent with the region's adopted long-range plan, Plan Bay Area 2050, and would leverage approximately $76 million in local funding and other federal formula funds. These projects also enable the provision of clean, accessible public transit across the region, and in accordance with FTA's Justice40 Initiative.

MTC looks forward to working with the Federal Transit Administration and our partner agencies to deliver these projects. The applications and detailed project information will be submitted by individual transit operators. Any funds awarded by FTA could be amended into the regional Transportation Improvement Program within one-to-two months of award, with federal approval of the amendment anticipated within three months. Please contact Margaret Doyle at 415-778-6743 or mdoyle@bayareametro.gov for any further information about our recommendation.

Sincerely,



Alix A. Bockelman
Deputy Executive Director, Policy

CC: Mark G. Bathrick, FTA
Ray Tellis, FTA

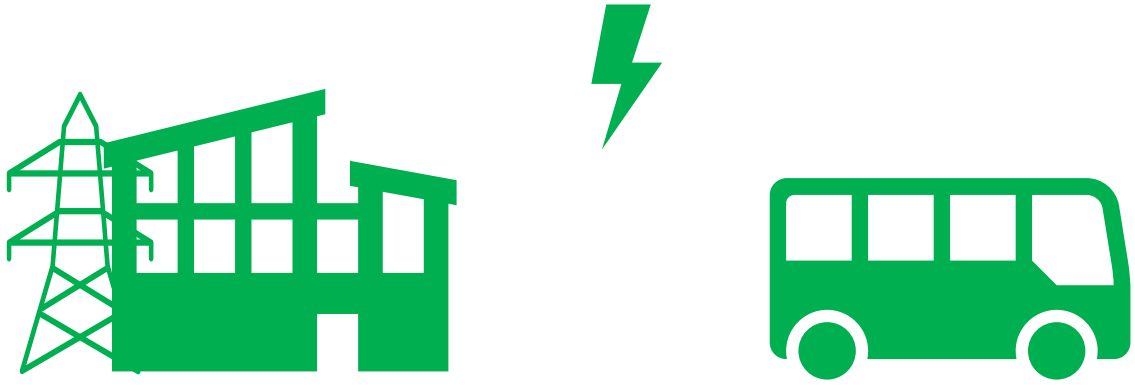
SFMTA

San Francisco Municipal Transportation Agency

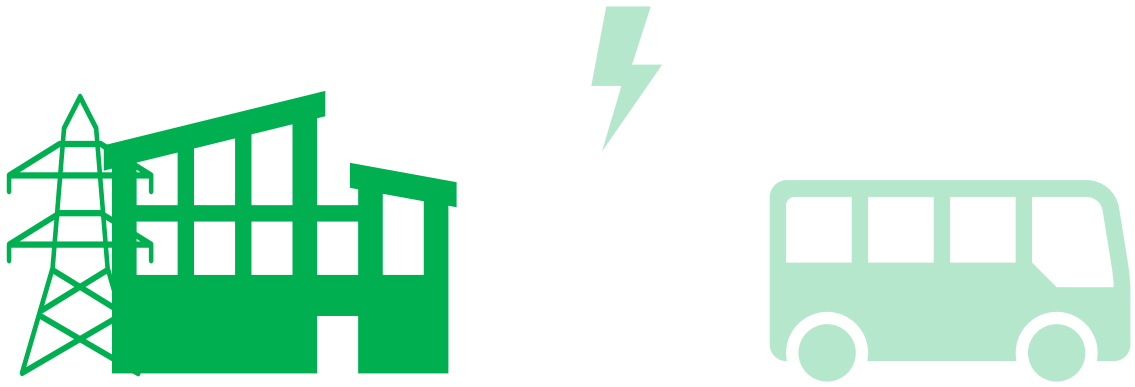
Update on Facilities and Fleet Programs

San Francisco County Transportation Authority Board

November 28, 2023



A **Zero Emission Muni Fleet** is possible with new technology and requires **facilities upgrades** to power and maintain this fleet.



The **Building Progress Program** will modernize and adapt our facilities and create new revenue opportunities for transportation.

Modernize aging SFMTA facilities in order to meet the needs of everyone who travels in San Francisco.

Resiliency

Improve the transportation system's resiliency to seismic events, climate change, technology changes.

Community

Make the SFMTA a better neighbor in the parts of the city that currently host our facilities.

Compliance

Meet regulatory compliance and policy goals related to fleet electrification.

Started in 2017, the **Building Progress Program is a $2+ billion planning and capital program** that continues to lead in innovative project delivery, adaptability, resilient planning and community outreach.

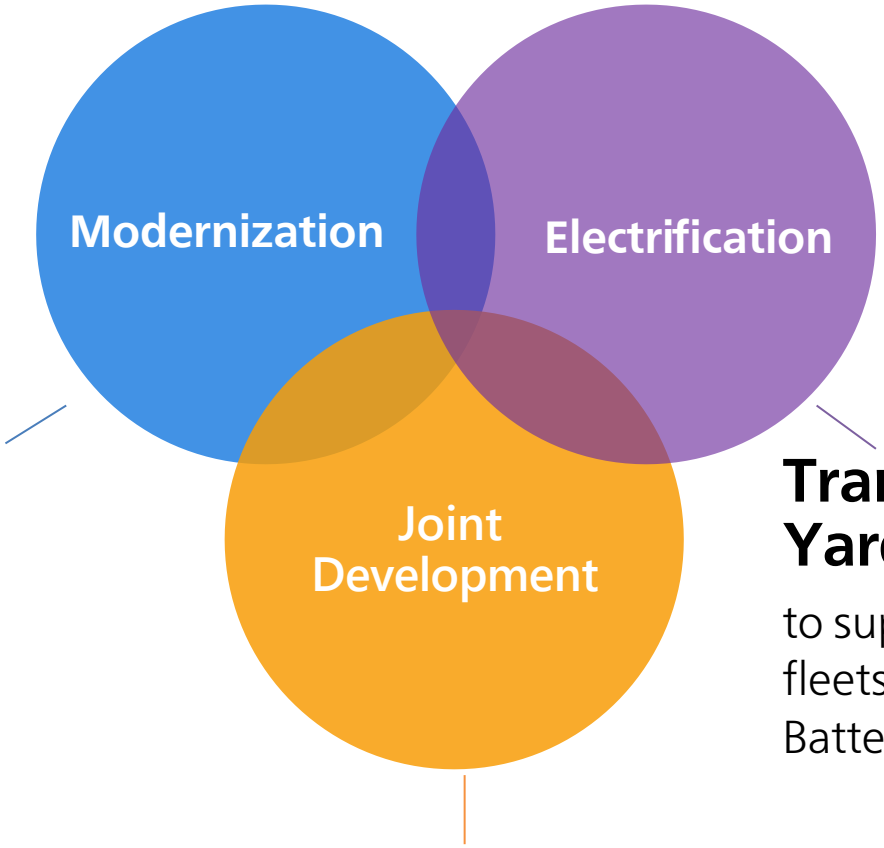
State of Good Repair

Stations **12**	Buildings* **31**
Acres of Land **60**	Building Sq. Feet **1.9 M**
Building Value **$2.6 B**	Backlog Value **$0.9 B**
Stations Value **$2.6 B**	Backlog Value **$0.7 B**

SFMTA State of Good Repair Report
2017 SFMTA Facilities Framework

Investment and rehabilitation in the SFMTA's campus of facilities across San Francisco takes on one of the agency's **biggest State of Good Repair challenges**.

Core Program Areas



Transform Muni Yards

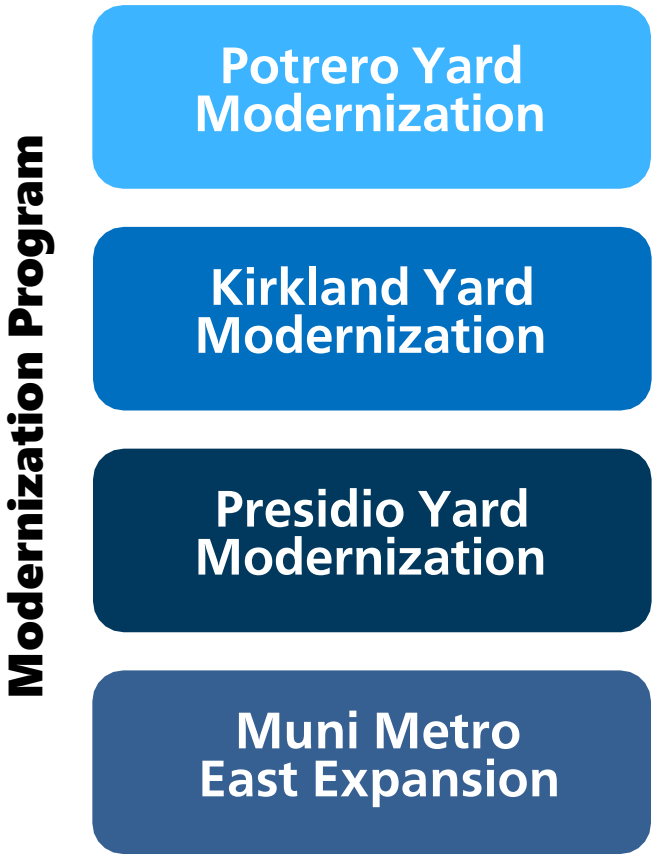
to support both the trolley fleets and expansion to Battery Electric Buses (BEBs).

Innovate Project Delivery

to finance Muni capital, maintenance and operations into the future.

Core Program Areas

Modernization Program	Potrero Yard Modernization Presidio Yard Modernization Kirkland Yard Modernization Muni Metro East Expansion
Electrification/ Retrofit Program	Woods and Islais Creek Yard Pilots Islais Creek Yard Electrification SFMTA Electrification EV Campus
Capital Program	1200 15th Street PCO HQ Station Escalators/Elevators (e.g. Castro) Operator Restrooms
Joint-Development Program	4th and Folsom Parking Garages Yard Modernization (Potrero + Presidio)
Cable Car Barn Program	Cable Car Barn Improvements Cable Car Barn Master Plan
Facility Condition Assessment (FCA) Program	Implementation of $200+ million in deferred maintenance and repairs



We have adjusted the **Modernization Program** based on:

- Muni Service
- Fleet requirements
- Regulatory requirements around electrification
- Funding availability + maximizing resources

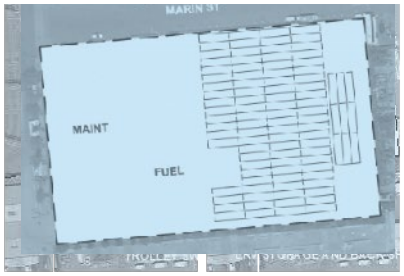
PROGRAM (2019)

Muni Metro East Expansion

Expand the site into the undeveloped 4 acres for a trolley coach facility

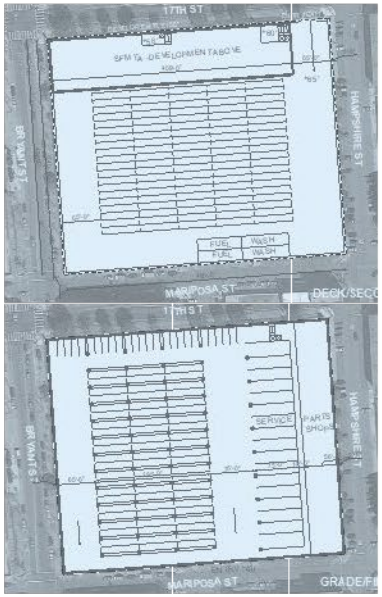
1399 Maintenance Facility

Build a trolley coach maintenance facility.



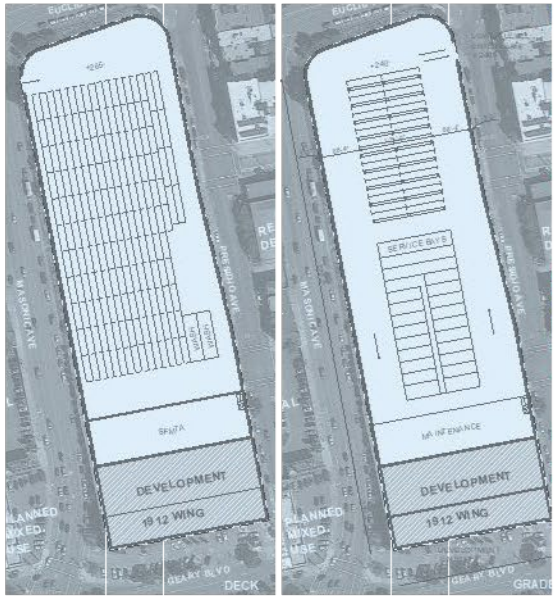
Potrero Yard

Rebuild as multi-level trolley facility with private development above



Presidio Yard

Rebuild as multi-level trolley and Zero Emission Bus Facility with private development adjacent



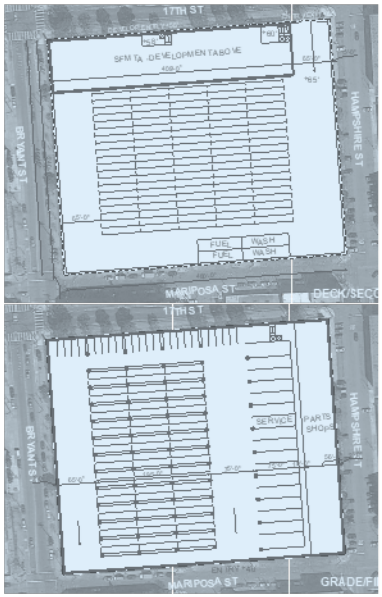
Kirkland Yard

Modernize as a new Zero Emission Bus Facility

UPDATED PROGRAM (2023)

Potrero Yard

Rebuild as multi-level trolley facility with private development above



Kirkland Yard

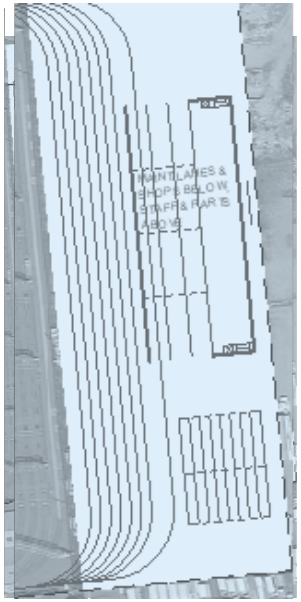
Modernize as a new Zero Emission Bus Facility

Presidio Yard

Rebuild as multi-level trolley and Zero Emission Bus Facility with private development adjacent

MME Expansion

Future fleet capacity and required swing.



500

Project Goals

Efficiency
Repair buses faster, improving Muni's reliability

Sustainability
Provide the green infrastructure needed for all-electric fleet

Future Growth
Accommodate fleet as it grows – room for 54% more buses at the yard

Work Conditions
Improve environments, amenities and safety conditions for 800+ staff

The Potrero Yard Modernization Project is designed and scoped to address several critical policy priorities:

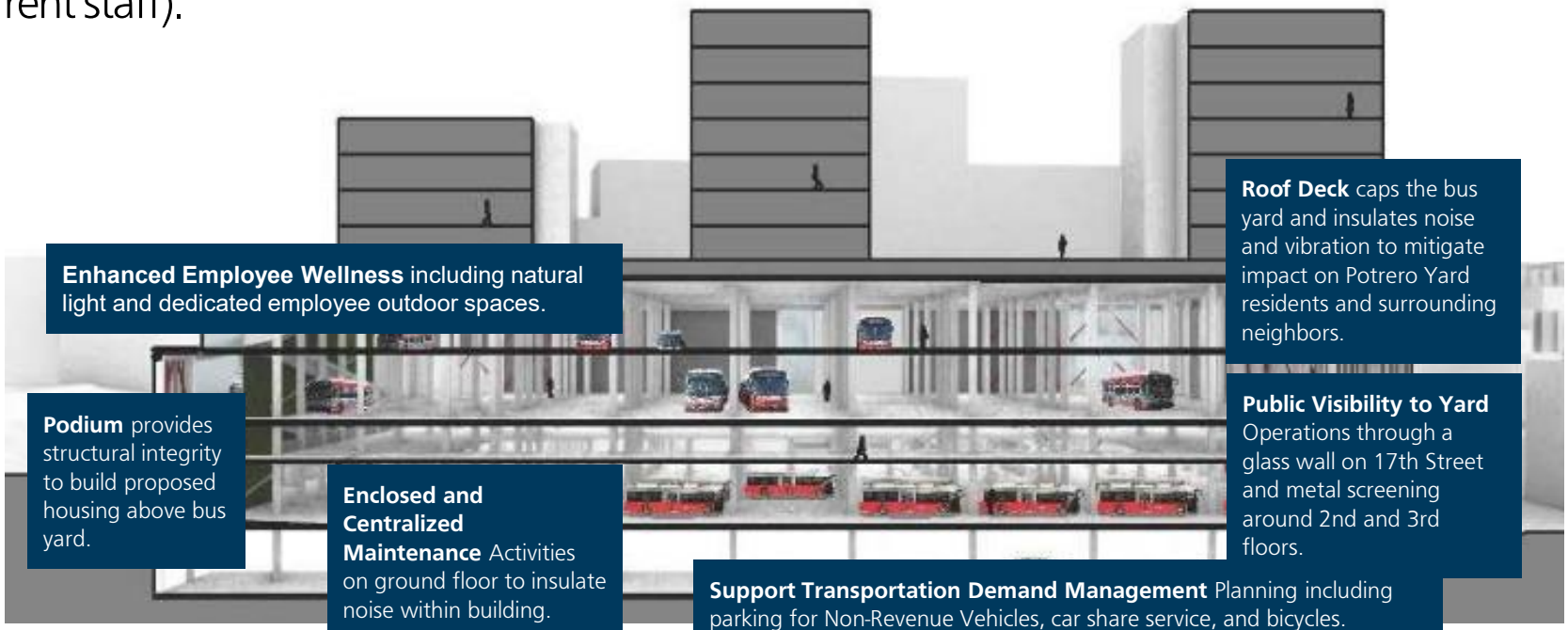
- ***State of Good Repair*** via the replacement of a 100-year-old maintenance yard.
- ***Climate and decarbonization*** via expanded vehicle capacity to create a large trolley hub.
- ***Housing*** via advancing an over 500-unit project consistent with the adopted Housing Element.
- ***Project Delivery*** via taking lessons learned and using new innovative methods of delivery.

BUS YARD

The foundation of the project is a modern and expanded bus yard growing from 221,450 gsf to 698,687 gsf to accommodate 213 trolley buses (54% increase) 829 employees (78% increase to current staff).

78% increase On-Site Employees

54% increase Bus Storage



The project is currently on-schedule, and the **critical path is advancing 100% schematic design, CEQA environmental requirements and land use entitlements/zoning**. A key focus for the project team is to keep the project on schedule.

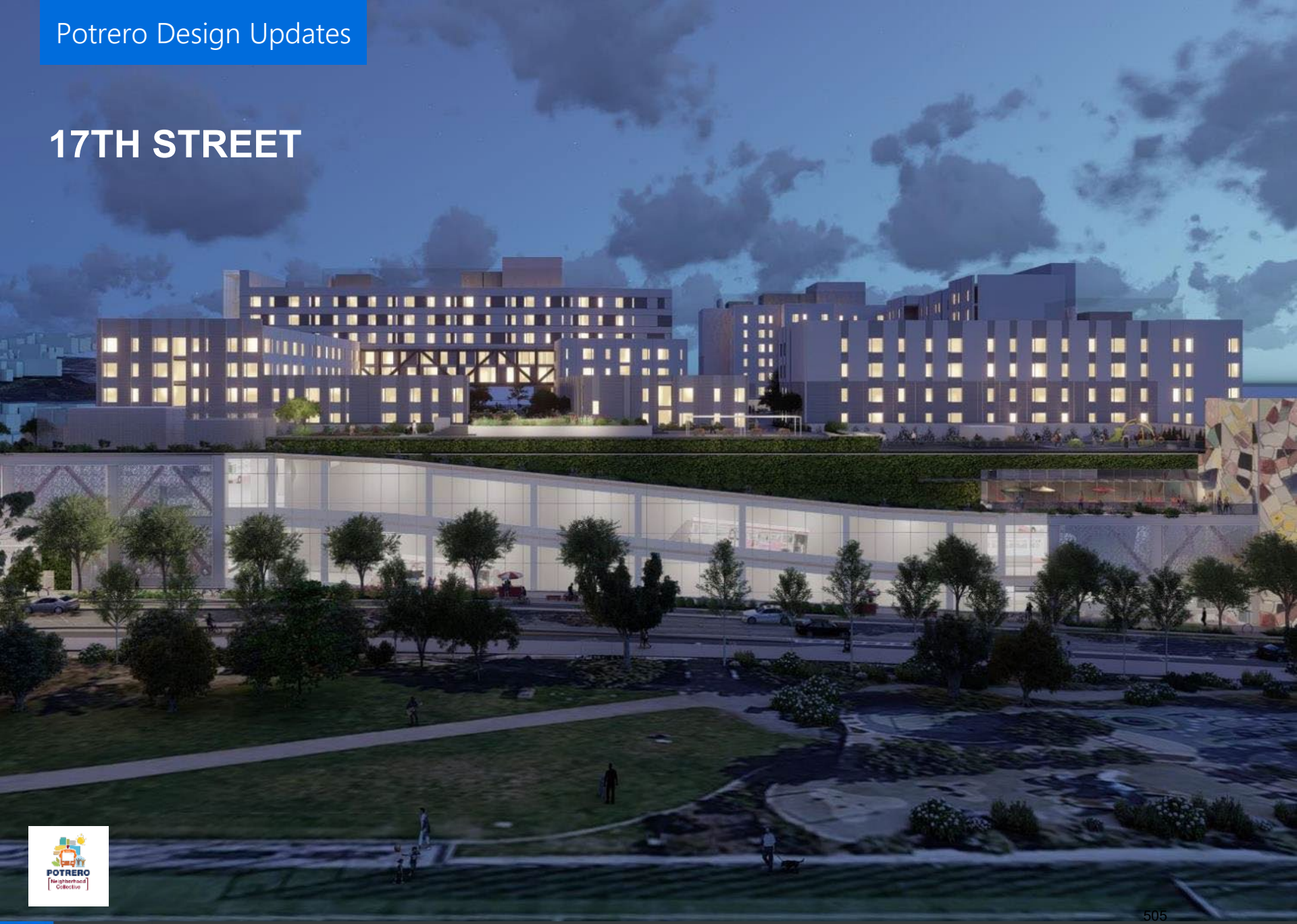
Schedule Milestone and Upcoming Tasks Include:

- **Mar 2023:** *Draft 50% schematic design* submitted to SFMTA
- **Apr 2023:** *Project application* submitted to Planning Department
- **May 2023:** *Final 50% schematic design* submitted to SFMTA
- **Sep 2023:** *Draft 100% schematic design* submitted to SFMTA
- **Anticipate Winter 2024:** At close of Predevelopment Agreement phases 1 & 2, CEQA and Entitlements certified by Planning Commission and approved by Board of Supervisors
- **Anticipate mid-2024:** At close of Predevelopment Agreement phase 3, Agreements for Project and Housing Commercial Components are approved by SFMTA Board and Board of Supervisors

VIEW FROM NORTHWEST

504

17TH STREET



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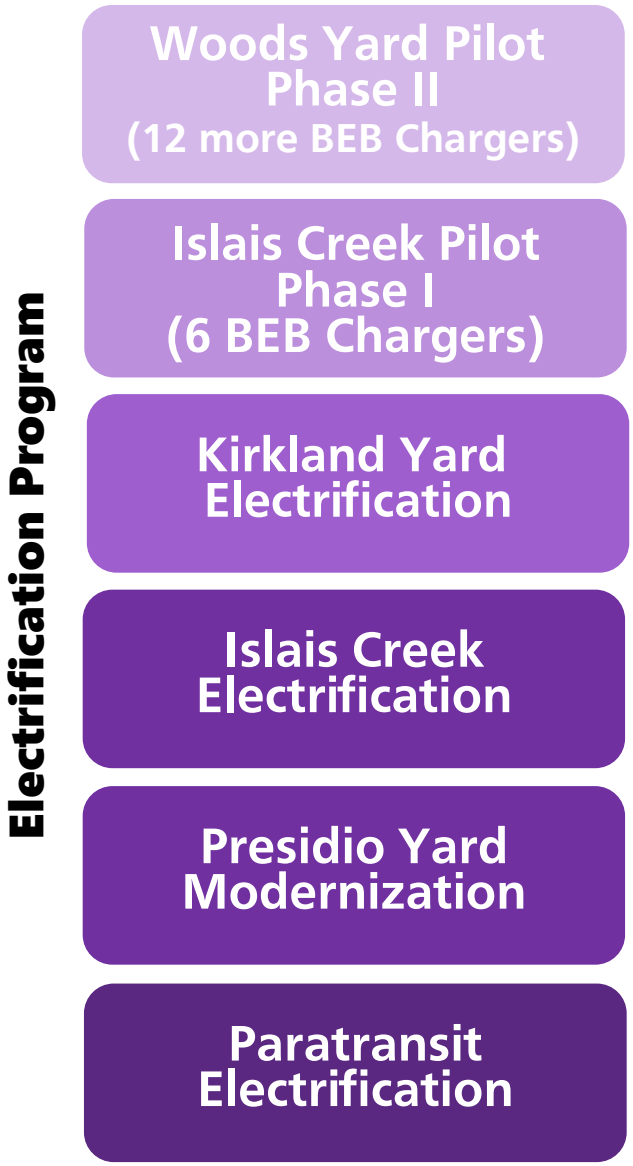
- Potrero Yard
- Presidio Yard
- Moscone Garage
- 5th and Mission Garage

The **Joint-Development program** maximizes land-use to generate revenue for transportation.

- Advancing Potrero Yard Housing Project.
- RFP was developed/released for Moscone Garage (pre-pandemic).
- Completed planning study for 5th and Mission Garage (pre-pandemic).
- Completed Caltrans Planning study for Presidio Yard.

506



The **Electrification/Retrofit Program** readies the SFMTA for transition to Zero-Emission vehicles.

- Reviewed transit fleet requirements – timing, size, type, technology.
- Schedule and project sequencing based on current regulatory requirements.

- Vehicle Procurement
- Charging Infrastructure
- Maintenance and Storage
- Funding
- Risks

SFMTA is coordinating project sequencing for modernization and electrification upgrades with the larger plan to move toward an **entirely zero-emission transit fleet.**

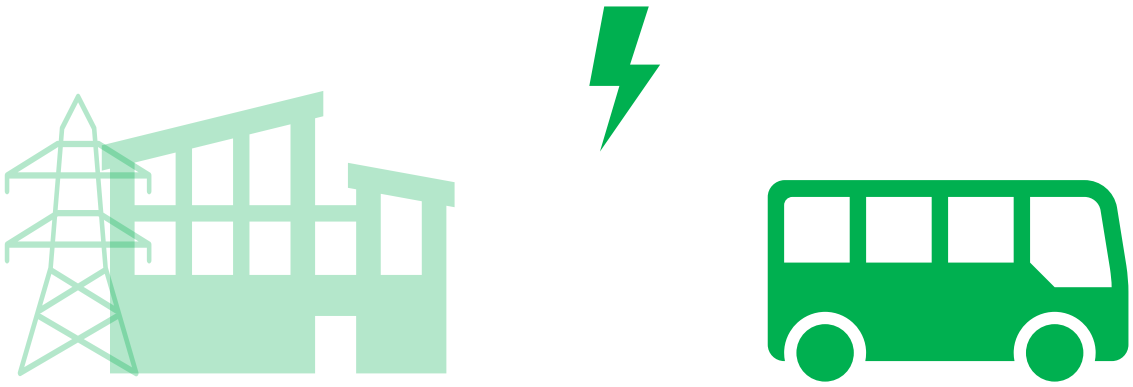
Procurement timing for battery electric buses is reliant on:

- Available charging infrastructure
- Storage capacity for new buses

Risks include:

- Power/Load Requirements
- On and Offsite Infrastructure
- PG&E Capacity and Timing
- Funding

508

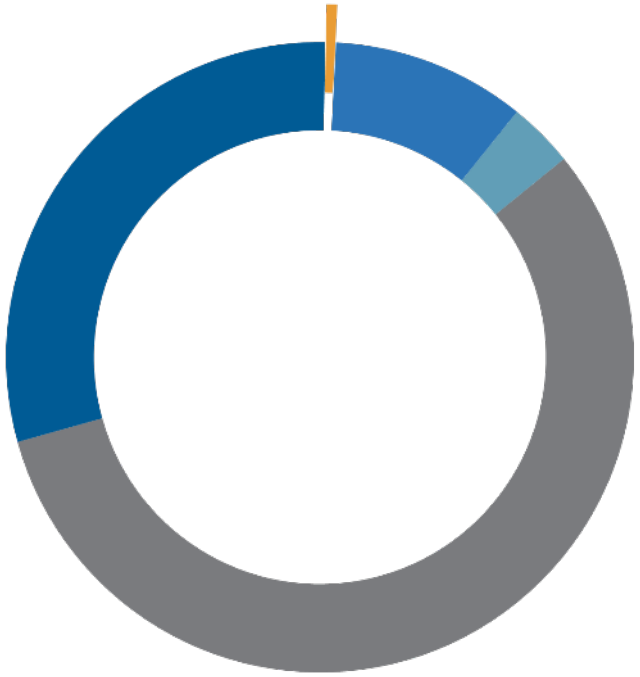


Our goal remains a 100% zero emission fleet. To reflect lessons learned and current conditions, we've charted a new path to get there.

Transportation accounts for about 44% of greenhouse gas emissions in San Francisco

510

Public transport as a whole **accounts for 0.55%** of greenhouse gas emissions in San Francisco



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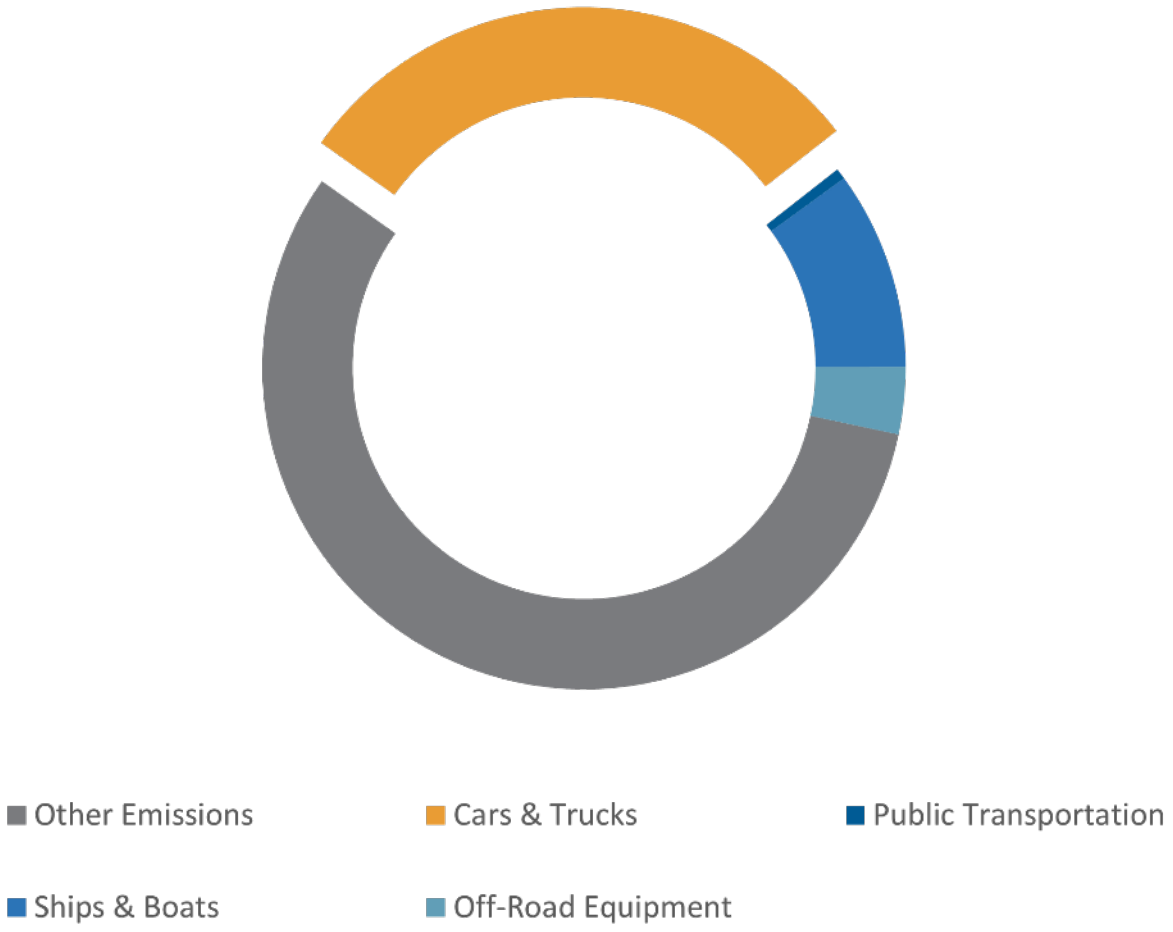
Private cars and trucks account for about 30% of greenhouse gas emissions in San Francisco



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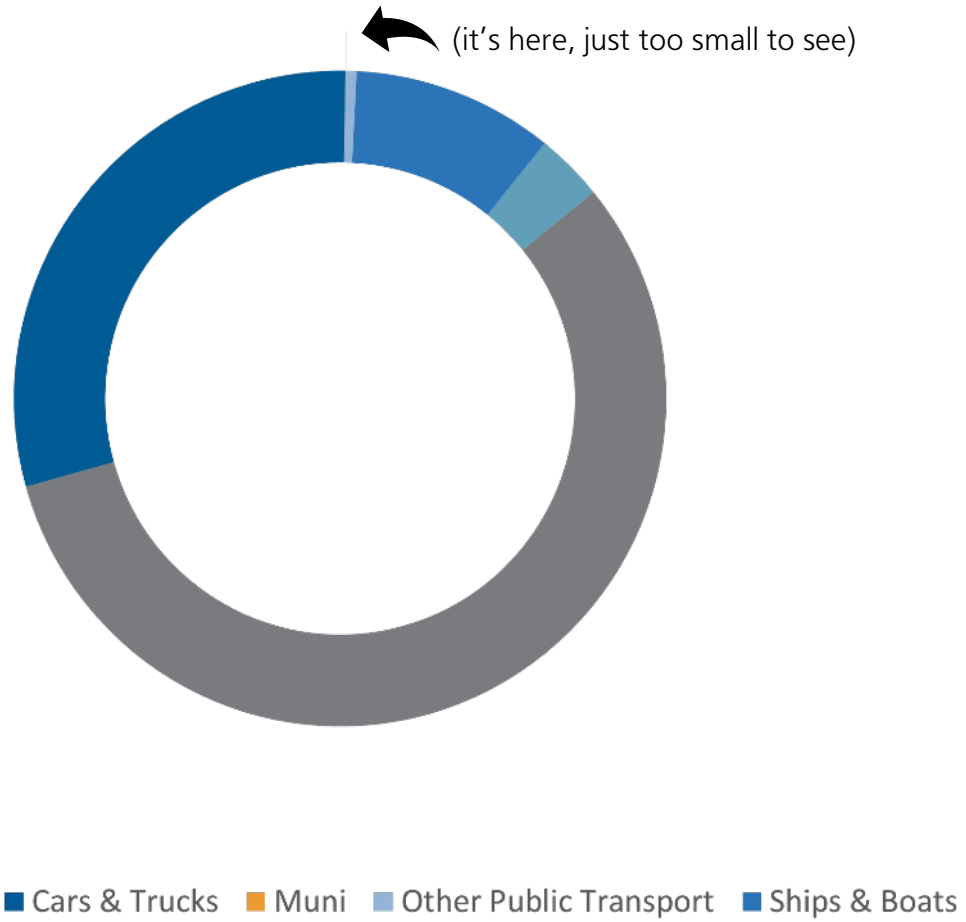
Muni accounts for < 0.001%
of greenhouse gas emissions in San Francisco



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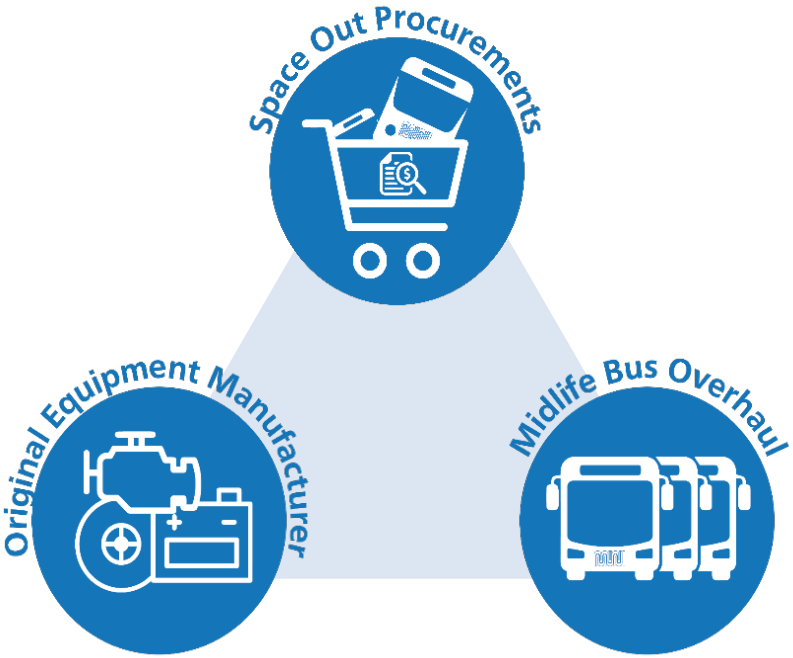
The best way to reduce vehicle emissions is to make **transit more reliable.**

Walking, rolling and using transit need to be more convenient and attractive than driving.

Right now, more reliable transit requires **more hybrid buses**.

- Maintain consistent fleet average age
- Performance-based procurements
- Uphold robust maintenance standards and midlife investments
- Align with city's sustainability goals



Electrification

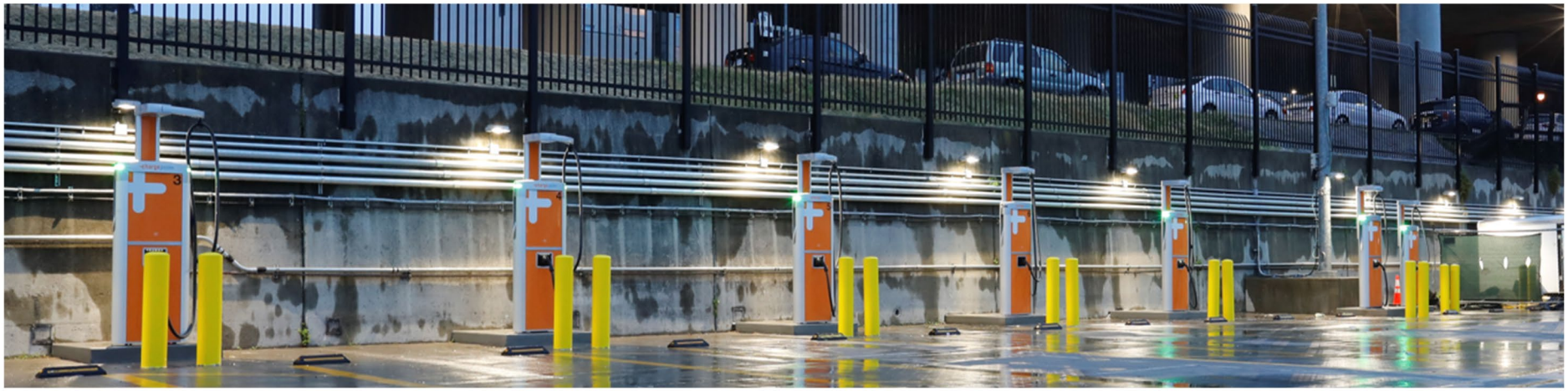
516

Progress Towards Zero Emissions

Electrification

518

Electrification



519

Zero Emission Vehicle Policy

520

Lessons & Challenges

521

Lessons & Challenges

522

Electrification

523

Next Steps

524

Trolleybuses are a critical part of a zero-emission future

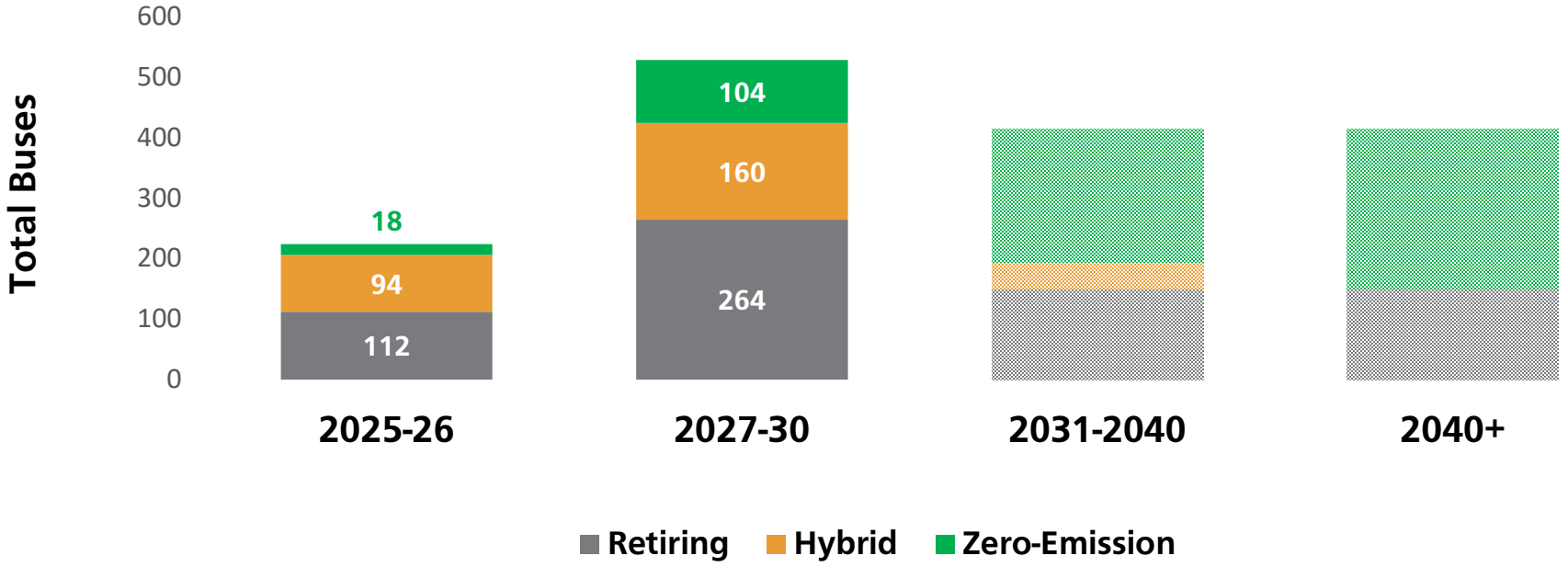
In-Motion Charging holds promise for some **trolley expansion in the future**

525

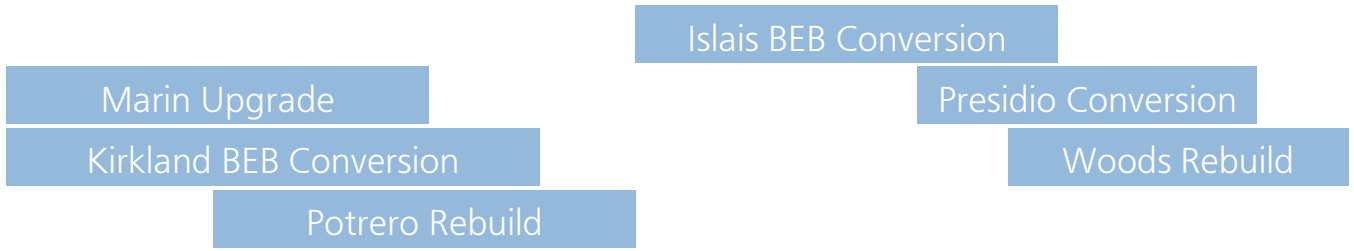
Proposed Procurement Plan

526

Hybrid and ZEV Procurements



Facilities Projects



527

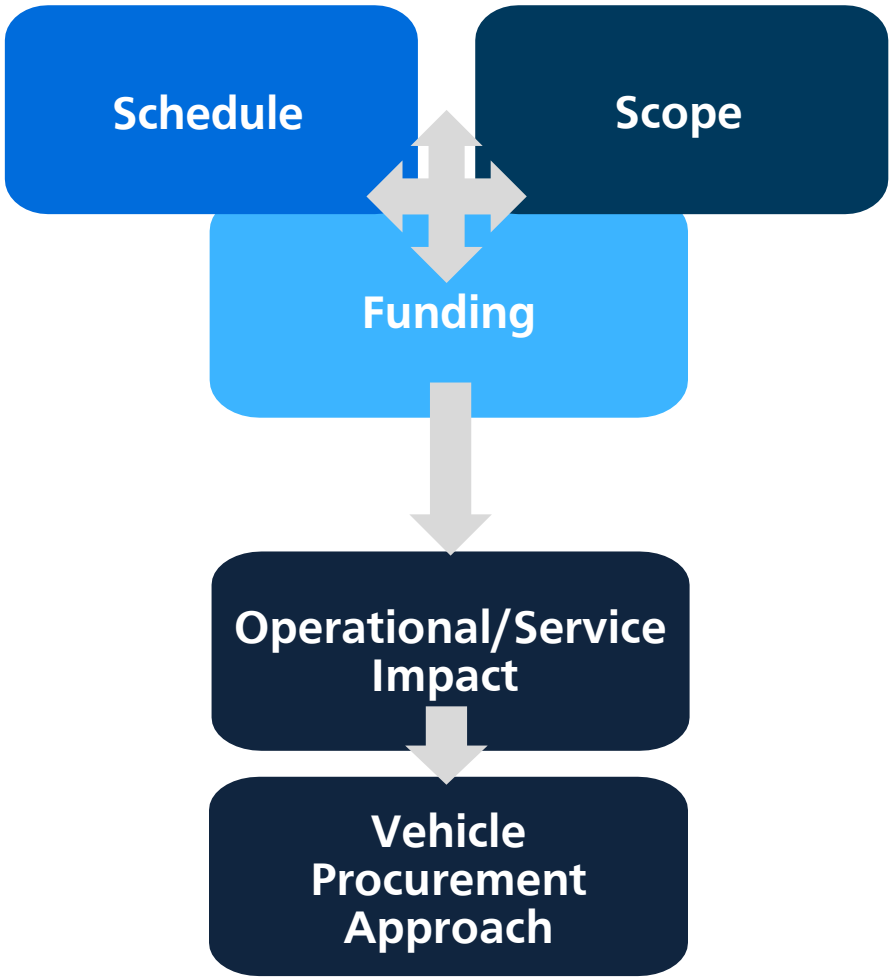
A Just Transition for our Workers

Transition to zero-emissions vehicles won't cut jobs

Labor Task	Union
BEB Maintenance	Local 1414
Trolley Maintenance	IBEW Local 6
Overhead & Charging Infrastructure	IBEW Local 6
Electronic Component Repair	IBEW Local 6

528

Electrification



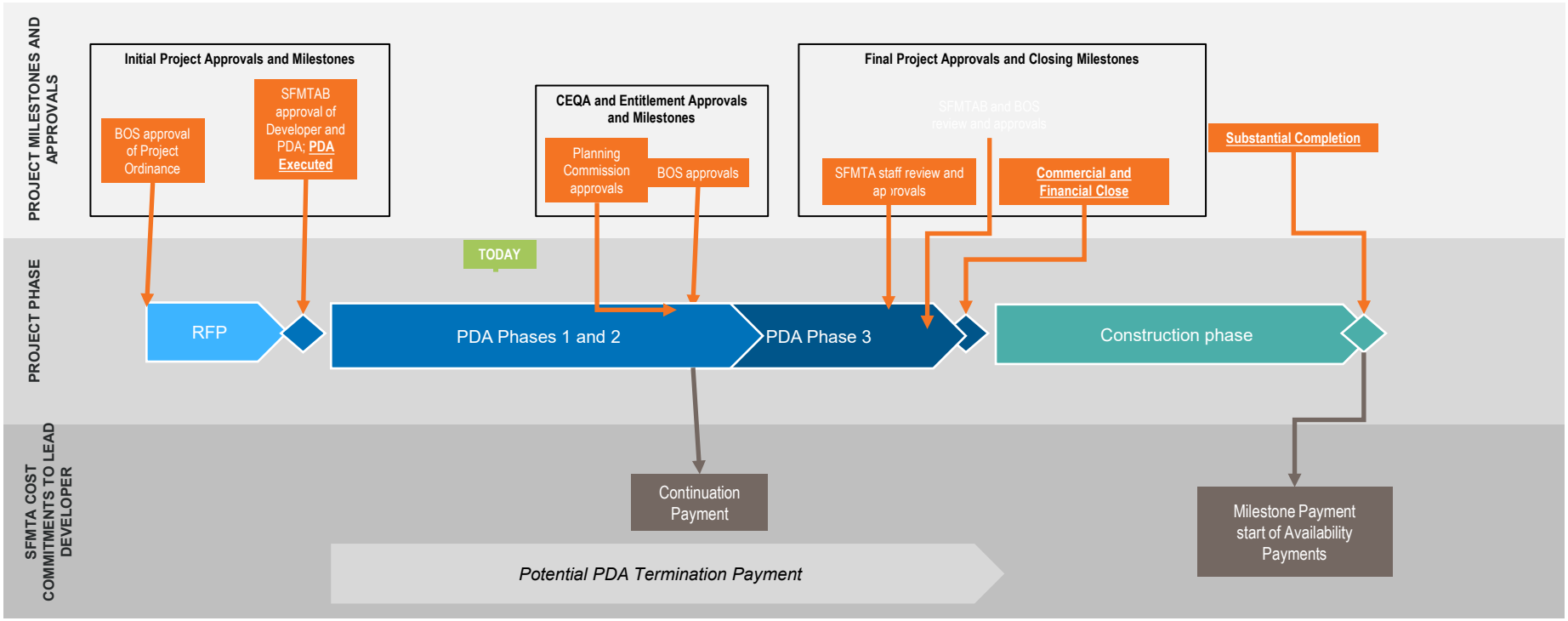
529


Thank you.


SFMTA
APPENDIX

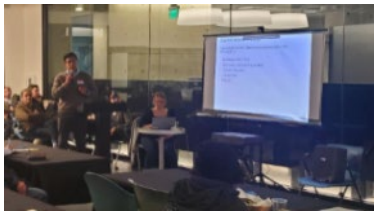
Potrero Schedule

The project is currently on-schedule, and the **critical path is advancing 100% schematic design, CEQA environmental requirements and land use entitlements/zoning**. A key focus for the project team is to keep the project on schedule.



Active engagement has been a foundational principal of this project – SFMTA goes to the communities where they are and works with our partners, including the Potrero Working Group since 2018, with PNC joining in Nov. 2022:

- Potrero Working Group meetings monthly
- Community Listening Sessions (ongoing)
- Pre-Application Meeting (December 13, 2022)
- District 9 Beautification Day (February 11, 2023)
- In-Reach Meetings (March 14 and May 26, 2023)
- Open House (March 18, 2023)
- Civic Design Review (March 20, 2023)
- KQED Fest (April 28, 2023)
- Virtual Public Meeting (May 17, 2023)
- Carnaval San Francisco (May 27-28, 2023)
- Survey on Open Decision Points (March – May)
- In-Reach Events (Sept 19, 2023)
- Community Open House (Sept 20, 2023)



PNC uniquely combines **global leadership in infrastructure development with local expertise** – all with a commitment to innovation, efficiency, and community inclusion.

Plenary

meda

YCD

TCDC

Affordable Housing Developer

- Experience developing affordable housing in San Francisco (Casa Adelante – 2060 Folsom, 1990 Folsom, 1296 Shotwell, Alice Griffith Apartments)
- Invested in enhancing the capacity of Black-led and Latin-led neighborhood rooted organizations in direct response to historic racial injustices committed against BIPOC communities.

IBI

Y.A.studio

Design Team

- 30+ years in architecture and design industry in infrastructure (Salt Lake City Intermodal Hub, GoRaleigh Operations and Maintenance Facility, GRT Northfield Drive Bus Facility, Hamilton Transit Maintenance Storage Facility)
- 23+ years of affordable housing (Casa Adelante, Hope SF Potrero Hill, The Avery, Parcel Q).

PLANT

THE ALLEN GROUP, LLC

WT

D&A COMMUNICATIONS

Consultants

- 30+ years of Bay Area commercial construction experience (100 Van Ness, UCSF – Clinical Science Building, Pier 70 – Horizonal Improvements + Public Realm)
- 19+ years of facilities maintenance and operational management experience
- 35+ years of Bay Area communications consulting

MARIPOSA STREET

PERSPECTIVE

535

BRYANT STREET

PERSPECTIVE

17TH STREET

PERSPECTIVE

POTRERO Neighborhood Collective

HAMPSHIRE STREET

PERSPECTIVE

538

YORK STREET

PERSPECTIVE

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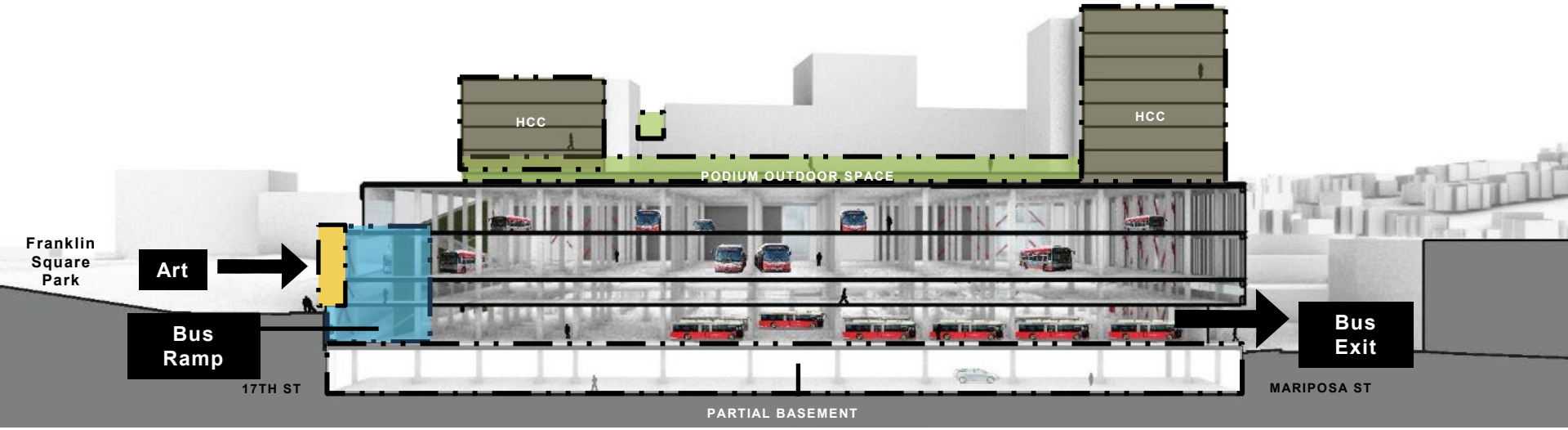
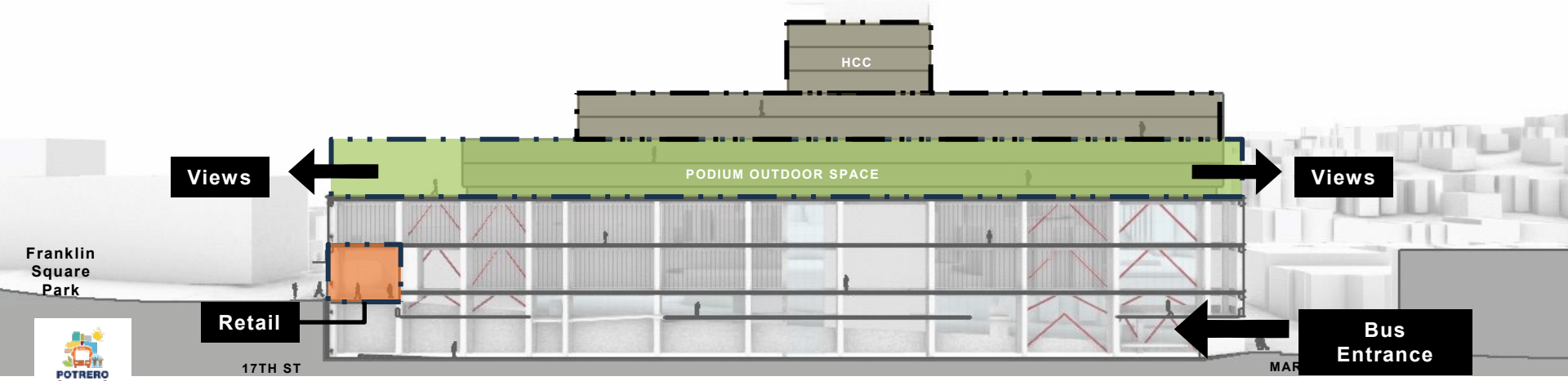
SECTIONS





POTRERO Neighborhood Collective

540

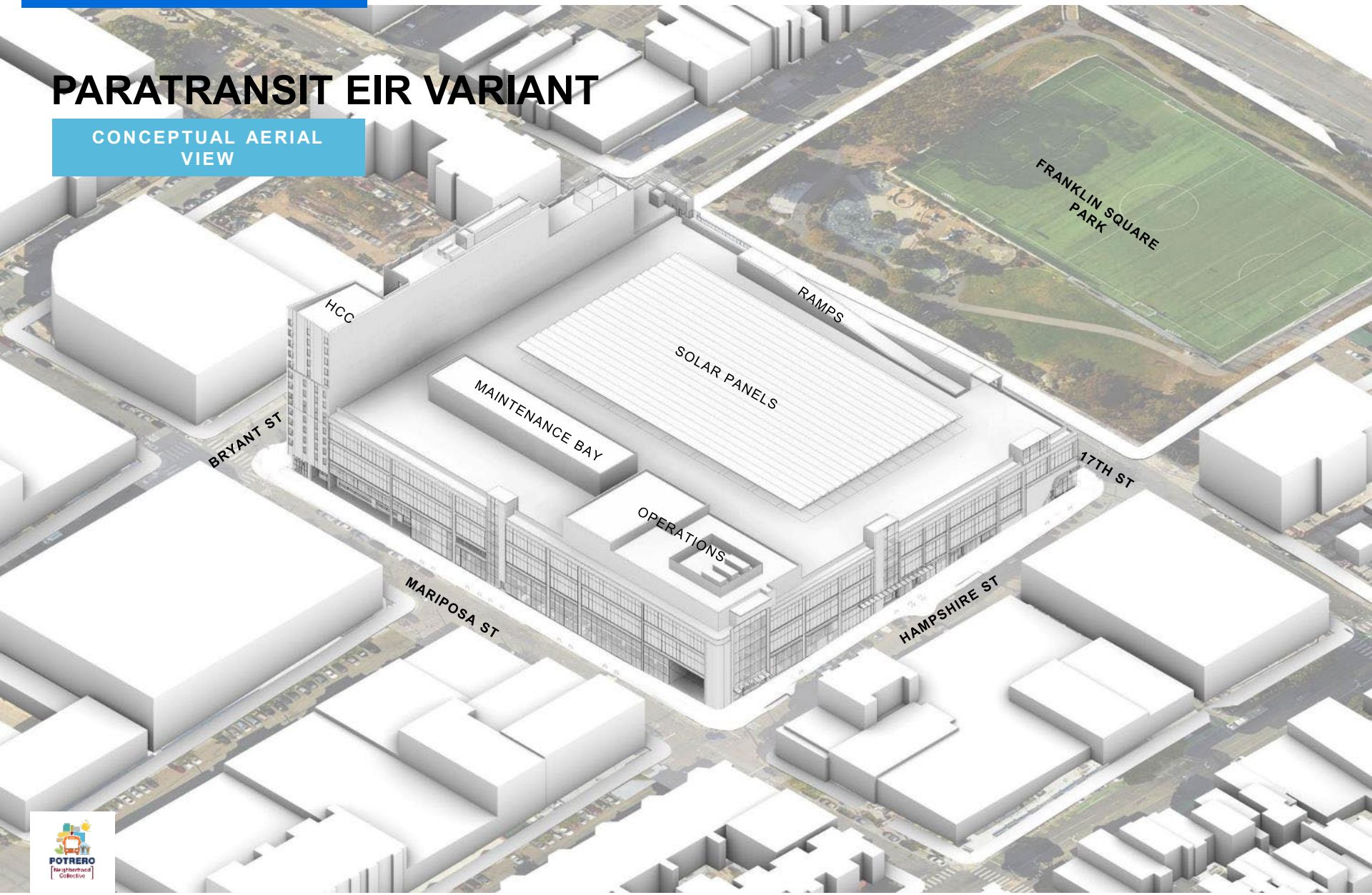

SFMTA, RETAIL AND
PUBLIC RESTROOM
ENTRY
ENTRY
27


RESIDENTIAL
ENTRY
1881 BRYANT

PODIUM

PARATRANSIT EIR VARIANT

CONCEPTUAL AERIAL VIEW



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Electrification

Trolleys are an important part of the SFMTA's ZEV Program

In Motion Charging are promising – currently conducting a pilot and planning to upgrade our existing fleet

100% Trolleys are not the best fit due to:

- Only one manufacturer available and they may not continue to build (also impacts parts/ support)
- State of good repair needs for trolley network should be prioritized over expansion (e.g., most substations are past their useful life)
- Public concerns over new overhead wires
- Facility challenges mirror BEB
- Still working on reliable process for going on/off wire

APPENDIX C:
MUNI VEHICLES ORDERED AND PLACED IN REVENUE SERVICE WITH PROP K AND PROP L FUNDS (AS OF DECEMBER 2024)