



Memorandum

AGENDA ITEM 11

DATE: February 21, 2020
TO: Transportation Authority Board
FROM: Anna LaForte - Deputy Director for Policy and Programming
SUBJECT: 3/10/2020 Board Meeting: Allocate \$60,732,027 in Prop K Sales Tax Funds, with Conditions, for Light Rail Vehicle Procurement

<p>RECOMMENDATION <input type="checkbox"/> Information <input checked="" type="checkbox"/> Action</p> <p>Allocate \$60,732,027 in Prop K funds, with conditions, to the San Francisco Municipal Transportation Agency (SFMTA) for Light Rail Vehicle (LRV) Procurement.</p> <p>SUMMARY</p> <p>On April 23, 2019, the Board continued consideration of the SFMTA’s request for \$62.7 million in Prop K funds for the Siemens LRV procurement in light of safety and reliability issues with the vehicle’s doors, brakes, and shear pins, among others. The Board directed staff to conduct independent oversight to identify the root cause of problems, effective fixes, as well as determine whether the cost of the solutions are covered under warranty or at the SFMTA’s expense. We secured the services of T.Y. Lin International to conduct an in-depth review of the issues raised. At the February 25 Board meeting, T.Y. Lin will present their findings and recommendations and SFMTA staff will also give an update on the LRVs. Overall, T.Y. Lin’s findings note that good progress is being made with repairs completed, increased availability of vehicles, and significantly improved reliability. There are a number of recommendations reflecting lessons learned and the need for continued oversight through attainment of the Mean Distance Between Failures (MDBF) reliability requirement and Phase 1 warranty repairs. The attached allocation request form incorporates these recommendations, including a condition to withhold reimbursement of the first \$31.4 million in Prop K funds until the Phase 1 LRVs pass the Reliability Demonstration Test (e.g., reach 25,000 MDBF), and implementation of the oversight protocol shown in Attachment 1. A summary of the Reliability Demonstration Test Requirements is included in Attachment 2.</p>	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fund Allocation <input type="checkbox"/> Fund Programming <input type="checkbox"/> Policy/Legislation <input type="checkbox"/> Plan/Study <input type="checkbox"/> Capital Project Oversight/Delivery <input type="checkbox"/> Budget/Finance <input type="checkbox"/> Contract/Agreement <input type="checkbox"/> Other: _____
---	--



DISCUSSION

Background.

The SFMTA is pursuing replacement of its existing fleet of 151 Breda light rail vehicles (LRVs) with an expanded fleet of 219 new Siemens LRVs. The procurement will take place in two phases. Phase 1, procurement of 68 LRVs to expand the current fleet, is nearly complete. Phase 2, procurement of 151 LRVs to replace the aging Bredas, is scheduled to start in Spring 2021 and be complete in early 2026. In October 2014, the Transportation Authority allocated \$131 million in Prop K funds to the project, with the expectation that both phases would be complete by mid-2027. The subject request is for an additional \$60.7 million in Prop K funds, programmed to the project as part of the 2019 update of the Prop K Strategic Plan.

Table 1: Status of Prop K Funds for Light Rail Vehicle Procurement

Phase	Scope	Prop K Funds Status	Prop K Commitment	Total Cost	Contract Cost
Phase 1	68 expansion	Allocated	\$ 4,592,490		
		Pending	\$ 96,661		
		Total	\$ 4,689,151	\$ 331,644,983	\$ 296,285,479
Phase 2	151 replacement	Allocated	\$ 126,560,654		
		Pending	\$ 60,635,366		
		Total	\$ 187,196,020	\$ 795,315,346	\$ 666,099,310
TOTAL Phases 1 + 2			\$ 191,885,171	\$ 1,126,960,329	\$ 962,384,789

The subject request incorporates an updated budget and funding plan, reflecting a \$14 million cost increase. The cost increase accommodates about \$10 million to reconfigure passenger seating on the Phase 1 vehicles, and about \$4 million to cover a recalculation of the cost escalation factor specified in the Siemens contract. Discussions between the SFMTA and Siemens are ongoing regarding the correct amount of the escalation amount. There is a possibility that escalation will increase. SFMTA and the Metropolitan Transportation Commission were able to split the cost of the \$14 million increase, drawing from their respective portions of the regional Transit Capital Priorities program comprised of federal formula funds and bridge toll matching funds. Resulting adjustments to the funding plan enabled SFMTA to reduce its Prop K request by \$2 million, compared to the original request last spring. Should escalation costs go up, those Prop K funds could be used to help cover the increase.

Staff Recommendations.



As noted above, our staff recommendations for the subject allocation request incorporate the recommendations from the independent oversight report produced by T.Y. Lin that is the subject of a separate agenda item at the February 26 CAC meeting. Highlights of a few key deliverables and special conditions are noted below.

As referenced earlier, we developed the oversight protocol shown in Attachment 1 with our project management oversight consultants and with SFMTA's input. Implementing the protocol is a recommended condition of allocation. We are also recommending that reimbursement of the first \$31.5 million in Prop K funds be conditioned, upon the Phase 1 vehicles passing a Reliability Demonstration Test that demonstrates a 25,000-mile MDBF for a period of 6 consecutive months. The \$31 million amount matches the sum of the retention payments in the Siemens contract: \$12.9 million in total retentions on Phase 1 vehicles and an \$18.6 million retention on the Phase 2 vehicles. The 25,000-mile MDBF is a contractual technical specification based on failures attributable to problems that are the responsibility of the vendor. The Reliability Demonstration Test is a contract deliverable.

To help ensure that new vehicles are maintained in a state of good repair, we are recommending that by September 1, 2020, SFMTA would provide a plan describing the preventative maintenance program for the new LRVs. This plan will address the pipeline of components that will need to be replaced in advance of midlife overhauls, including cost and schedule. We also have recommended conditioning the allocation on a commitment by the SFMTA to maintain the new LRVs in a state of good repair, including a mid-life overhaul program, subject to availability of funding.

To address the updated funding plan and the timing of availability of the various fund sources, the SFMTA's request requires amendment of the Prop K Strategic Plan to advance the reimbursement schedule relative to what is currently programmed in the plan. This does result in about a \$5 million increase in financing costs over the entire Prop K program. See the Financial Impacts section below and the attached Allocation Request Form for details.

The Allocation Request Form (Attachment 7) lists the recommended deliverables and special conditions, and contains additional detail on the scope, schedule, cost, and funding plan for the subject request.

FINANCIAL IMPACT

The recommended action would allocate \$60,732,027 in Prop K funds. The allocation would be subject to the Fiscal Year Cash Flow Distribution Schedules contained in the attached Allocation Request Form.

Funding the proposed allocation for Light Rail Vehicle Procurement requires a Prop K Strategic Plan amendment to advance \$96,661 in cash flow from FY23/24 to FY21/22 in the Purchase Additional Light Rail Vehicles category, advance \$17,183,425 in cash flow from FY2021/22 to FY2020/21 in the Vehicles-Muni category, and advance \$3,965,843 in cash flow from FY2022/23 to FY2020/21 in the Vehicles-Undesignated category. The amendment would result in an increase of 0.18% (\$5,331,461) in anticipated financing costs for the Prop K program as a whole, over its 30-year life, which we consider to be minor. See the attached allocation request form for the amendment details.



Attachment 4 shows the approved Fiscal Year 2019/20 allocations and appropriations to date, with associated annual cash flow commitments as well as the recommended allocations, appropriations, and cash flow amounts that are the subject of this memorandum.

Sufficient funds are included in the Fiscal Year 2019/20 budget to accommodate the recommended actions. Furthermore, sufficient funds will be included in future budgets to cover the recommended cash flow distribution for those respective fiscal years.

CAC POSITION

The CAC will consider this item at its February 26, 2020, meeting.

SUPPLEMENTAL MATERIALS

- Attachment 1 - Oversight Protocol
- Attachment 2 - Reliability Demonstration Test (Mean Distance Between Failures) memo
- Attachment 3 - Request Summary
- Attachment 4 - Project Description
- Attachment 5 - Staff Recommendations
- Attachment 6 - Prop K Allocation Summary - FY 2019/20
- Attachment 7 - Allocation Request Form

Attachment 1

SFCTA Project Management Oversight (PMO) Protocol for Siemens Light Rail Vehicle Procurement

Project Management Oversight (PMO) provides a proactive dialogue with the project sponsor while analyzing progress to provide the sponsor with professional opinions and recommendations for action. A critical component is to assess the reasonableness of the scope, schedule and cost, and assess the likelihood that the cost and schedule will hold through completion or revenue service. As part of its oversight, the San Francisco County Transportation Authority (SFCTA) PMO may identify problems and suggest solutions to the project sponsor.

The oversight approach described below is predicated on the shared goal of on-time, on-budget and successful delivery of the Siemens Light Rail Vehicle Procurement project (Project) and on the desire for an approach that is integrated into the Project Management Team's procedures and protocols rather than layering on an additional layer of oversight. The SFCTA PMO is both performing a traditional oversight role and serving as a resource to the Project Management Team.

1. The SFMTA-assigned project manager shall be available to the SFCTA PMO over the course of the project, providing requested documentation and facilitating discussions with members of the project team as requested.
2. The SFMTA shall submit monthly progress reports through the SFCTA's online grants portal (portal.sfcta.org). Monthly progress reports shall provide percent complete for the overall project scope, the number of vehicles received, the number of vehicles placed into revenue service, and total expenses incurred (not necessarily invoiced to Prop K) during the reporting period in the previous quarter. Progress reports shall include the most recent vehicle testing and commissioning data, including procurements pursuant to the base contract and any Prop K funded contract options. These reports should be comprehensive in nature and include a detailed description of issues of concern, root cause, proposed solution and status of repair/modifications including but not limited to data on average monthly miles of service, mean distance between failures, as well as any safety, contractual, operational, warranty findings/reports, etc.
3. The SFMTA project manager shall include the SFCTA PMO in internal and external meetings as requested by the SFCTA PMO and agreed to by the project manager, including meetings with vendor, subcontractors and/or consultants.
4. If the Federal Transit Administration (FTA) assigns a PMO contractor (PMOC) to the Project, the SFCTA PMO shall be notified and invited to attend all meetings with the FTA PMOC over the course of the project.
5. At SFCTA PMO discretion, the SFCTA PMO shall:
 - a. Review progress and cost reports and provide comments.
 - b. Participate in pre- and post-delivery vehicle assessment, including review of acceptance reports.
 - c. Participate in all risk workshops and risk management meetings, when scheduled to:
 - i. assess all the items that place the Project at risk as may be included in the risk register;
 - ii. update probability ratings and cost and schedule impacts; and
 - iii. discuss the status/progress of mitigation measures and add new risks as they become evident.
 - d. Participate in all SFMTA Transportation Capital Committee meetings at which scope, schedule, and budget changes to the Project are reviewed. The SFCTA PMO shall review proposed changes in advance of their submittal to the Transportation Capital Committee and provide comment and feedback. The SFMTA project manager or his/her designee shall provide the materials to the SFCTA PMO with a reasonable amount of time for review.
 - e. Review all safety certification processes and documents produced by or for the SFMTA, the state Public Utilities Commission or the FTA.
 - f. Review the test program and have the opportunity to be present for the testing of vehicle systems.

Attachment 2

SFMTA LRV4 Program

Funding Allocation Request



To: Anna Laforte
Through: Jeffrey Tumlin
From: Julie Kirschbaum
Date: February 17, 2020
Subject: SFMTA LRV4 Mean Distance Between Failures

This memo provides a summary of the Reliability Demonstration Test requirements for the LRV4 Contract, as well as an overview of SFMTA's contract authority to hold Siemens accountable to successfully complete the Program.

- The LRV4 Technical Specification requires the fleet to achieve a Mean Distance Between (Chargeable) Train Delays of 25,000 miles.
- Chargeable delays are defined as mechanical failures that are attributable to the design of the train and related ancillary systems, such as the radio. Service failures attributable to Operator or Mechanic actions, as well as send ins related to cleanliness or no defect found are excluded from this analysis.
- This Reliability Demonstration Test is a formal deliverable (CDRL 11) in the testing program.
- The Reliability Demonstration began in August 2018, as we needed enough vehicles in service to demonstrate a *long-term stable reliability*. For this reason, it is among the last tests performed.
- Siemens must demonstrate 25,000 miles for a period of six months and rework the vehicle/repeat the test until it is achieved.
- There are no penalties for not reaching the target; however, the deliverable is not achieved until it is accomplished.
- SFMTA is holding Phase 1 retention payments pending successful completion of the Reliability Demonstration Test. Although we anticipate reaching this milestone sooner, SFMTA will extend the retention hold to Phase 2 vehicles if the demonstration program extends into the Breda replacement process.

A summary of the retention payments is outlined in Table 1.

SFMTA LRV4 Program

Funding Allocation Request



Table 1. Summary of Retention Payments

Payment	Percent	Amount	Description
Currently Held		\$3,055,293	
Engineering and Test Item 1D	3%	\$337,870	Completion and acceptance of vehicle performance qualification testing
Engineering and Test Item 1E	8.6%	\$840,368	Completion of acceptance of test program
Engineering and Test Item 1F	5%	\$1,877,055	Completion and acceptance of all contract requirements
May be Withheld		\$28,401,821	
Phase 1 Retention: Vehicle Punchlist	3%	\$6,787,590	Retention for each vehicle until punch list items are completed
Retention on other Phase 1 items		\$3,051,706	Retention on change orders, manuals, etc.
Phase 2 Retention: Vehicle Punchlist	3%	\$18,562,525	Retention for each vehicle until punch list items are completed
Total Available Retention		\$31,457,114	

Attachment 3: Summary of Requests Received

Source	EP Line No./Category ¹	Project Sponsor ²	Project Name	Current Prop K Request	Total Cost for Requested Phase(s)	Leveraging		Phase(s) Requested	District(s)
						Expected Leveraging by EP Line ³	Actual Leveraging by Project Phase(s) ⁴		
Prop K	15, 17M, 17U	SFMTA	Light Rail Vehicle Procurement	\$ 60,732,027	\$ 1,126,960,331	84%	95%	Construction	Citywide
TOTAL					\$ 60,732,027	\$ 1,126,960,331	84%	95%	

Footnotes

¹ "EP Line No./Category" is either the Prop K Expenditure Plan line number referenced in the 2019 Prop K Strategic Plan or the Prop AA Expenditure Plan category referenced in the 2017 Prop AA Strategic Plan, including: Street Repair and Reconstruction (Street), Pedestrian Safety (Ped), and Transit Reliability and Mobility Improvements (Transit).

² Acronyms: SFMTA (San Francisco Municipal Transportation Agency)

³ "Expected Leveraging By EP Line" is calculated by dividing the total non-Prop K funds expected to be available for a given Prop K Expenditure Plan line item (e.g. Pedestrian Circulation and Safety) by the total expected funding for that Prop K Expenditure Plan line item over the 30-year Expenditure Plan period. For example, expected leveraging of 90% indicates that on average non-Prop K funds should cover 90% of the total costs for all projects in that category, and Prop K should cover only 10%.

⁴ "Actual Leveraging by Project Phase" is calculated by dividing the total non-Prop K or non-Prop AA funds in the funding plan by the total cost for the requested phase or phases. If the percentage in the "Actual Leveraging" column is lower than in the "Expected Leveraging" column, the request (indicated by yellow highlighting) is leveraging fewer non-Prop K dollars than assumed in the Expenditure Plan. A project that is well leveraged overall may have lower-than-expected leveraging for an individual or partial phase.

Attachment 4: Brief Project Descriptions¹

EP Line No./ Category	Project Sponsor	Project Name	Prop K Funds Requested	Project Description
15, 17M, 17U	SFMTA	Light Rail Vehicle Procurement	\$60,732,027	Purchase 151 new Siemens Light Rail Vehicles (LRVs) to replace outdated Breda vehicles that are approaching the end of their useful lives, and purchase an additional 68 LRVs to expand Muni's light rail fleet. The purchase includes all associated engineering, manufacture, testing, and warranties for the vehicles, as well as training, manuals, spare parts and special tools to support the new fleet. The new vehicles will improve reliability and be much easier to maintain, The SFMTA expects all of the new LRVs to be approved for service by December 2025, which reflects a 14-16 months of schedule savings compared to the original schedule.
TOTAL			\$60,732,027	

¹ See Attachment 1 for footnotes.

Attachment 5: Staff Recommendations¹

EP Line No./ Category	Project Sponsor	Project Name	Prop K Funds Recommended	Recommendation Highlights
15, 17M, 17U	SFMTA	Light Rail Vehicle Procurement	\$ 60,732,027	<p>Prop K Strategic Plan and 5-Year Prioritization Program (5YPP) amendments: Recommended allocation is contingent on an amendment to the Prop K Strategic Plan and the relevant 5YPPs to advance \$96,661 in cash flow from FY23/24 to FY21/22 in the Purchase Additional Light Rail Vehicles category, advance \$17,183,425 in cash flow from FY2021/22 to FY2020/21 in the Vehicles-Muni category, and advance \$3,965,843 in cash flow from FY2022/23 to FY2020/21 in the Vehicles-Undesignated category. See Attachment 1 in allocation request form for details.</p> <p>Reimbursement of the first \$31,457,114 in Prop K funds is conditioned upon the Phase 1 vehicles (68 expansion) passing the Reliability Demonstration Test that demonstrates 25,000-miles Mean Distance Between Failures for a period of 6 consecutive months. See Attachment 2 in allocation request form for details.</p> <p>The allocation is conditioned upon implementation by the SFMTA and Transportation Authority of the Project Management Oversight Protocol for Siemens Light Rail Vehicle Procurement, for both Phases 1 and 2. See Attachment 3 in allocation request form for details.</p> <p>Recommended allocation requires SFMTA to provide a plan describing the preventative maintenance program for the Siemens LRVs by September 1. The plan will address replacement of components or sub-components that need to occur in advance of the vehicles' midlife overhaul, including cost and schedule.</p>
TOTAL			\$60,732,027	

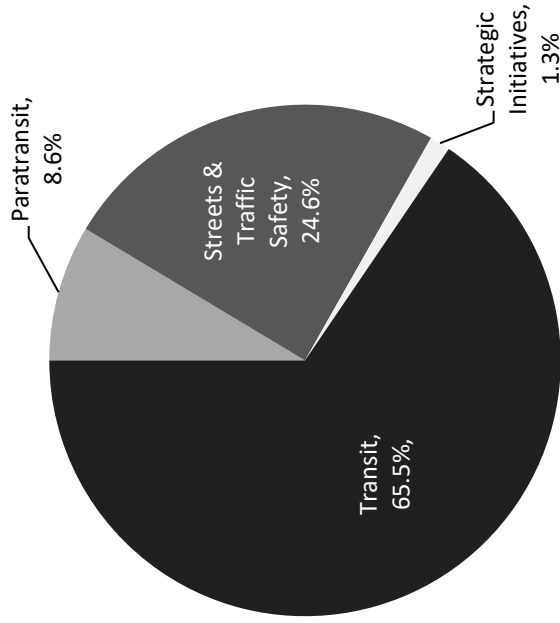
¹ See Attachment 1 for footnotes.

**Attachment 6.
Prop K and Prop AA Allocation Summaries - FY 2019/20**

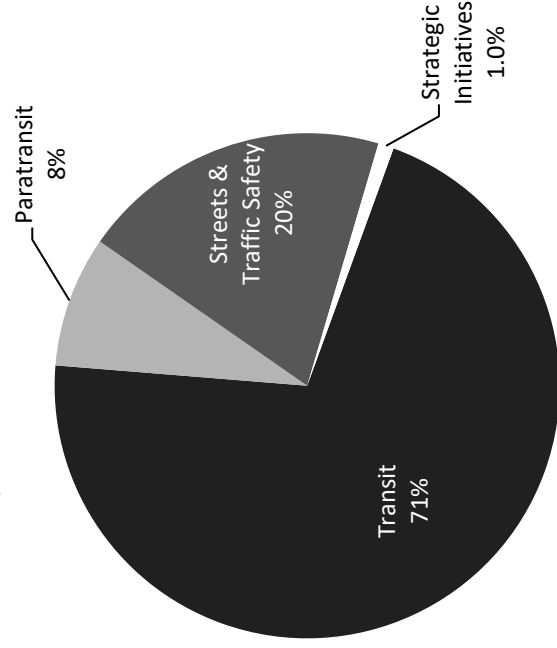
PROP K SALES TAX		\$40,000	\$25,000	\$15,000				
Total		FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26
Prior Allocations	\$ 73,328,808	\$ 23,173,415	\$ 33,420,981	\$ 7,281,046	\$ 3,354,622	\$ 2,690,622	\$ 2,690,622	\$ 717,500
Current Request(s)	\$ 60,732,027	\$ -	\$ 21,149,268	\$ 96,661	\$ 6,580,107	\$ 32,869,459	\$ 36,532	\$ -
New Total Allocations	\$ 134,060,835	\$ 23,173,415	\$ 54,570,249	\$ 7,377,707	\$ 9,934,729	\$ 35,560,081	\$ 2,727,154	\$ 717,500

The above table shows maximum annual cash flow for all FY 2019/20 allocations and appropriations approved to date, along with the current recommended allocation(s).

**Investment Commitments,
per Prop K Expenditure Plan**



Prop K Investments To Date



San Francisco County Transportation Authority

Prop K/Prop AA Allocation Request Form

FY of Allocation Action:	FY2019/20
Project Name:	Light Rail Vehicle Procurement
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN INFORMATION

Prop K EP categories:	Vehicles - Undesignated, Purchase Additional LRV's, Vehicles - MUNI
Current Prop K Request:	\$60,732,027
Supervisory District(s):	Citywide

REQUEST

Brief Project Description

Purchase 151 new Light Rail Vehicles (LRVs) to replace outdated Breda vehicles that are approaching the end of their useful life and purchase an additional 68 LRVs to expand Muni's light rail fleet, 24 of which will accommodate the opening of Central Subway, 4 for the Golden State Warriors Arena (Chase Center) in Mission Bay, and 40 for citywide service expansion.

Detailed Scope, Project Benefits and Community Outreach

See UPDATED detailed scope description and project background, attached.

Project Location

Citywide

Project Phase(s)

Construction (CON)

5YPP/STRATEGIC PLAN INFORMATION

Type of Project in the Prop K 5YPP/Prop AA Strategic Plan?	Named Project
Is requested amount greater than the amount programmed in the relevant 5YPP or Strategic Plan?	Greater than Programmed Amount
Prop K 5YPP Amount:	\$62,767,638

Justification for Necessary Amendment

The SFMTA is requesting an amendment to the Prop K Strategic Plan to advance cash flow of \$96,661 for purchase of LRVs to expand the existing fleet from FY23/24 to FY21/22 in the Purchase Additional Light Rail Vehicles category (EP-15); advance cash flow of approximately \$17.2 million from FY2021/22 to FY2020/21 in the Vehicles-Muni category; and advance cash flow of approximately \$4 million from FY2022/23 to FY2020/21 in the Vehicles-Undesignated category.

The amendment would result in a minor 0.19% or \$5.3 million increase in finance costs to the Strategic Plan as a whole.

Detailed Scope, Project Benefits and Community Outreach

On September 9, 2014, the San Francisco Board of Supervisors unanimously approved a 15-year light rail vehicle (LRV) procurement contract with Siemens Industry, Inc., for the SFMTA to purchase up to 260 new LRVs. The base contract is for 175 cars, 151 cars to replace the existing Breda LRVs and 24 additional cars needed for increased service demand for the Central Subway and Mission Bay. The contract also includes two options to acquire up to a total of 85 additional LRVs to meet projected future ridership growth and system capacity expansion needs through 2040. The SFMTA has already optioned the first 40 expansion vehicles and still reserves the right to option the remaining 45 expansion vehicles in the contract. The SFMTA procured an additional four expansion vehicles through a change order to the contract to accommodate an increase in ridership due to the construction of the Chase Center.

Highlights of the project are:

1. The project will grow SFMTA's LRV fleet by more than 45 percent and will help move the Agency forward toward achieving its strategic goal of creating a safer, more efficient and reliable transportation system.
2. The new vehicles are purchased at a 20 percent lower cost than the SFMTA projected cost.
3. The purchase includes all engineering, design, manufacture, test, and warranty of the vehicles together with training, manuals, spare parts and special tools to support the new fleet.
4. The new cars are to maintain, and reliability will improve from the current Breda fleet level of approximately 5,000 miles between failures to a contractual requirement of 25,000 miles between failures.
5. LRVs are designed and built at the Siemens plant in Sacramento, CA which will stimulate economic growth by creating more jobs in the Northern California region while facilitating communications between Siemens and the SFMTA, enabling faster response of postdelivery support while saving on costs for delivery and travel.
6. The proposed vehicle offers safety enhancements such as hydraulic brakes, bright LED lighting, and improved driver visibility.

In 2012, the San Francisco Municipal Transportation Agency (SFMTA) broke ground of the first major subway system expansion in decades. The Central Subway project connects the existing T-Third light rail line to a new subway tunnel at 4th & King and will bring subway service to three new subway stations: Yerba Buena/Moscone Center, Union Square, and Chinatown. To support the increased service demand for the Central Subway project as well as system-wide growth along the Mission Bay corridor, the SFMTA selected Siemens Mobility to provide 24 expansion vehicles, and to provide a critically-needed replacement fleet of 151 existing vehicles which will reach the end of their useful life beginning in 2021. The SFMTA has since optioned an additional 40 expansion vehicles to support increased ridership along the T-Third corridor and purchased an additional four cars funded out of the Mission Bay Transportation Improvement Fund to better serve the new Chase Center. This represents a total of 68 expansion cars, the last of which is expected to enter revenue service by summer 2020.

The SFMTA pursued a very aggressive manufacturing and delivery schedule: the SFMTA issued Notice to Proceed on September 19, 2014. The first vehicle was delivered in January 2017 and entered service in November 2017. The SFMTA achieved system-wide regular service in fall of 2018 and plans to accelerate the procurement of the second phase of the procurement: the purchase of 151 replacement light rail vehicles.

The SFMTA has worked with the Metropolitan Transportation Commission (MTC) and the Transportation Authority to develop an accelerated procurement of 151 replacement light rail vehicles. Together, the three agencies have finalized a funding plan that provides the necessary funds on an accelerated schedule and also provides supplemental funding needed for change orders as well as escalation costs.

The revised timeline will accelerate delivery of the replacement vehicles by shortening the overall delivery window from six and a half years to five. The chief advantages are providing more reliable service sooner

to the public and reducing operations and maintenance costs by retiring older vehicles that cost more to maintain in adequate condition. The primary tradeoff considered was financing costs needed to ensure cash is on hand to meet the proposed accelerated schedule. These costs reduce funds that would be available for other projects, including future vehicle procurements.

In developing this proposal, the SFMTA completed a cost-benefit analysis which was presented to the San Francisco Transportation Authority Board in Spring 2019. This analysis identified a range of potential savings (costs) of \$37 million (\$8 million). Costs are associated with Prop K financing, potential FTA financing and one-time cost for Siemens to re-tool production facilities to add production capacity. The benefits identified include dramatically reduced need for major system overhauls on the legacy Breda fleet, the reduction of risk associated with major component failures and parts obsolescence, and the comparatively significant, and growing, parts and labor costs of maintaining the Breda fleet over the next five to seven years. The upcoming replacement phase will provide critically needed relief for our aging light rail fleet and ensure that the SFMTA can continue to provide frequent, reliable and sustainable transportation to the residents and visitors of San Francisco.

Phase 2 Update (151 Replacement LRVs)

The change orders that will be incorporated into the next phase of the project address passenger feedback to improve comfort, others address issues raised by maintenance and operations staff to improve the operability and maintainability of the fleet over the next 25 years. The full list of these items and their anticipated associated costs can be viewed in *Scope Attachment A*. Noteworthy changes are highlighted in *Scope Attachment B*. They include changes to seating type and configuration based on extensive public outreach and feedback, updating the track brake design to address flattened wheels, as well as numerous maintenance-related requests to reduce the amount of time required to maintain the vehicles in a state of good repair. These change orders have been refined over the past eighteen months in collaboration with MTC and the SFCTA as well as with union leadership and operations and maintenance staff. It is important to note that these change orders differ from the ongoing warranty items, whose costs are borne solely by Siemens, that are briefly described below.

In April 2019, the project faced a series of significant setbacks which required renewed attention to the systems engineering and design. The project team worked collaboratively with Siemens to resolve the urgent issues of poor door sensitivity and failed coupler components, and all vehicles were retrofitted and returned to regular, unrestricted operations by July 2019. The couplers again faced challenges in December 2019 when we experienced a failure of the shear bolt in revenue service. On evaluation, Siemens determined the bolts to be safe for use in coupled vehicles if replaced every 120 days. At present, Siemens is developing an updated coupler design to permanently address this second failure and the fleet is operating without restrictions. These updated designs will be incorporated into the procurement at zero cost to SFMTA.

In addition to these high-profile mechanical issues, Siemens has redoubled efforts to improve the vehicle's overall reliability by continuing progress towards the contractual reliability standard of 25,000 miles between failures (MDBF). After a few challenges due primarily to a component called the hydraulic power unit (HPU) in May and June 2019, the reliability program has continued to make significant progress towards the reliability goals established by Siemens and the project team.

Note

For additional details on these issues, see the Independent Management and Oversight Report of the SFMTA's Siemens LRV procurement on the February 25, 2020 Transportation Authority Board agenda.

Supplemental Materials

Attachment A: Phase 2 Change Order Rough Order of Magnitude Costs

Attachment B: LRV4 Project Updates Included in Phase 2

**Attachment A:
Phase 2 Change Order Rough Order of Magnitude Costs**

Change Order	Mod 5	Mod 6	Mod 7	Total
Track brakes, remaining vehicles	\$470,000	\$1,280,000	\$2,940,000	\$4,690,000
Additional Flip Seats (Legacy item)	\$ -	\$700,000	\$ -	\$700,000
Interior Seating -Single Transverse 50 vehicles (2A)	\$ -	\$710,000	\$7,650,000	\$8,360,000
Interior Seating - Double Transverse 101 vehicles (2B)	\$ -	\$160,000	\$2,390,000	\$2,550,000
Interior Seating -Single Transverse retrofit 68 vehicles	\$ -	\$ -	\$7,460,000	\$7,460,000
Exterior Car shell Roof Access Steps (legacy item)	\$ -	\$830,000	\$ -	\$830,000
Illuminated and twisting PBEB	\$ -	\$140,000	\$ -	\$140,000
LRV4 Decals	\$ -	\$100,000	\$ -	\$100,000
MDS wireless communication to Wayside	\$ -	\$90,000	\$ -	\$90,000
Front step momentary switch	\$ -	\$70,000	\$ -	\$70,000
Relocation of clipper DCU	\$ -	\$60,000	\$ -	\$60,000
Rotation of CCTV firetide router	\$ -	\$30,000	\$ -	\$30,000
Replace door touch strips with passenger door open PBs	\$ -	\$ -	\$270,000	\$270,000
Provisions for ease of tire replacement	\$ -	\$ -	\$410,000	\$410,000
PIS 40 A pattern change	\$ -	\$ -	\$370,000	\$370,000
Corner Hatch additional retention clips	\$ -	\$ -	\$250,000	\$250,000
Self locking exterior EDR door	\$ -	\$ -	\$270,000	\$270,000
Televic PIS change items	\$ -	\$ -	\$190,000	\$190,000
Pre Wiring for Additional Clipper card readers	\$ -	\$ -	\$210,000	\$210,000
Lockable Convenience Outlet	\$ -	\$ -	\$160,000	\$160,000
TDR6 HDD Unmounted	\$ -	\$ -	\$40,000	\$40,000
Step Audible and visual alert 1.5s before moving	\$ -	\$ -	\$ -	\$ -
Bracket for 5lb Fire Extinguisher	\$ -	\$ -	\$ -	\$ -
Floor Hatch Fasteners to Philips head	\$ -	\$ -	\$ -	\$ -
Remove J Holder for Advertising placards	\$ -	\$ -	\$ -	\$ -
Reduce Deadman delay to zero seconds	\$ -	\$ -	\$ -	\$ -
Track Iron holder clips	\$ -	\$ -	\$ -	\$ -
Front door push button to Blue	\$ -	\$ -	\$ -	\$ -
Additional of door open Tape Switch	\$ -	\$ -	\$ -	\$ -
Passenger Emergency Stop PB	\$ -	\$ -	\$ -	\$ -
Total	\$470,000	\$4,170,000	\$22,610,000	\$27,250,000

Additional costs that are not design/engineering modifications:

	Mod 5	Mod 6	Mod 7	Total
Accelerated Schedule	\$ -	\$ 5,600,000	\$ 19,900,000	\$ 20,460,000

The accelerated delivery schedule timeline is demonstrated below, and will result in 14-16 months of schedule savings by compressing the delivery of the Siemens cars and subsequent retirement of the legacy Breda fleet:

Original	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expansion	68													
Replacement					151									
Accelerated	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Expansion	68													
Replacement					151									

Attachment B: LRV4 Project Updates Included in Phase 2

At the execution of the LRV4 project in 2014, the contract included provisions to provide opportunity for both sides to revisit the lessons learned during the Phase 1 Expansion and to incorporate changes into the Phase 2 Replacement. As we prepare to initiate Phase 2, we have reviewed the procurement, gathered substantial feedback from the public, staff, maintenance, and operations, to ensure the public benefit from these lessons learned.

Contract Mod 7. Includes three types of updates:

1. Design and engineering updates to correct warranty-related issues identified in Phase 1
2. Design and engineering updates to improve on the original design
3. An accelerated production and delivery schedule to enable a faster Phase 2 and an earlier retirement of our legacy Breda fleet

Beginning in April 2019, several maintenance and engineering items have come to public attention. To ensure clarity on what constitutes a change order, an item whose cost is borne by the SFMTA, and what constitutes a warranty item, an item whose cost is borne by Siemens, we are providing the following summary.

This list is not exhaustive of every change order or of every warranty item. However, it provides a background and summary for the items that, to date, have received elevated public scrutiny to provide clarity and improve comprehension of what items are included in the funding request and what items are subject to ongoing warranty claims.

WARRANTY ITEMS

Warranty items are those covered due to unexpected and premature failure of a component on the fleet. The LRV4 vehicle is covered by a five-year, all-inclusive warranty that begins at vehicle acceptance. This means that vehicles have a rolling deadline for warranty expiration based on the month and year they were accepted into service. Warranty items come at **zero cost** to the SFMTA, they are addressed by Siemens and its subcontractors.

Fleetwide Defects

The early stage of any fleet procurement faces unique challenges where components and designs are put into service and occasionally do not function as expected. This may result in premature failures of parts that sometimes may require a full fleetwide retrofit. The SFMTA has experienced several well-documented instances of both kinds of failure and has endeavored to minimize the impact to passengers by initiating stopgap measures wherever safe to do so while a longer-term fix is developed. Fleetwide defects are by nature impossible to prepare for. They are a systemic and unexpected malfunction that are impossible to predict and head off. In some cases, this has required the use of parts from non-commissioned vehicles, essentially "borrowing" parts to keep vehicles in service from a vehicle that is not currently used for service. This was most recently done by using parts from car 2033. In other cases, we have been able to access new parts via Siemens' manufacturing line which has reduced the length of time between discovering an issue and installing either a short- or long-term fix to keep the fleet available for service. These defects are covered under warranty and diminish in number over time. Below is a list of major

fleetwide defects we experienced during Phase 1, all of which were covered under warranty. Each updated design will be incorporated into the original design and manufacture of the Phase 2 vehicles.

Auxiliary Power Supply

Description

The Auxiliary Power Supply (APS) Line Choke is on the roof of the car and is part of the vehicle power supply. It is **not** intended to be waterproof, as air circulation is critical, but should drain when wet.

Issue

During winter of 2018-2019 we experienced several failures and at least one instance of arcing. An analysis determined the mounting provided inadequate drainage, with water pooling in the unit resulting in the failures.

Resolution

Siemens updated the mounting design to improve drainage and outfitted all expansion vehicles with the correct mounting to resolve the issue. This design will be incorporated into the replacement phase production at no cost.

Pantograph

Description

Pantographs are the equipment on the top of the light rail vehicle that collects power from the overhead catenary and passes it to the vehicle.

Issue

A pantograph overheated and caused a fault while in service. An analysis determined that Nyloc nuts were inappropriately used, and that the design should move to an all-metal fastener and include additional shunts to provide a low-resistance path of the electric current to move safely.

Resolution

Siemens updated the design including new nut types and shunts. All expansion vehicles were retrofitted to resolve the issue. This design will be incorporated into the replacement phase production at no cost.

Door Sensitive Edges

Description

The LRV4 vehicles have a single panel door at the entrance adjacent to the operator cab located at either end of the vehicle.

Issue

In spring 2019, there were several instances of passengers whose hands became caught in the single panel doors located adjacent to the operator cab, but which were not registered as obstructions by the system. A review of the incidents and a subsequent analysis determined the single-panel doors to have inadequate sensitivity.

Resolution

Siemens added an additional sensitive edge to enhance the range of obstructions that could be sensed by the system. All expansion vehicles were retrofitted to resolve the issue. This design will be incorporated into the replacement phase production at no cost.

Coupler

Description

The coupler is a vehicle component that allows for two or more trains to be joined under the control of a single operator. The SFMTA currently operates vehicles in two-car *consists* or couples, but the LRV4 vehicle is designed to operate up to four cars coupled together.

Issue

An operator reported a coupler failure, which, on inspection, showed a broken *shear bolt*. A shear bolt is a component within the coupler that is designed to fail first to protect the more complex and critical components within the coupler when it experiences undue strain. An analysis determined that a second component within the coupler, the mounting plate, did not have adequate clearance for horizontal swing, and was causing damage to other components within the coupler.

Resolution

Siemens updated the design and deployed the fix to the expansion vehicles. However, in December 2019, Siemens notified SFMTA that they believe additional work is required before this issue can be deemed resolved. That same day, an operator reported a failure of a coupler in the maintenance yard.

The SFMTA is currently replacing the shear bolts on a 120-day cycle while Siemens works with its subcontractor to address the issue and develop a long-term fix. The updated design will be applied to the expansion fleet and incorporated into the design and manufacture of the replacement fleet at no cost to the SFMTA.

Hydraulic Power Unit

Description

The Hydraulic Power Unit (HPU) supports the hydraulic friction brakes.

Issue

During the latter half of 2019, the HPUs were failing in service at an extremely high rate that was resulting in service delays for passengers and dramatically reduced reliability figures for the LRV4 fleet. An analysis identified a component called the *motor driver board* to be the cause of these failures.

Resolution

Siemens developed an update to the motor driver boards and issued a Field Modification. All expansion vehicles were retrofitted to resolve the issue. This design will be incorporated into the replacement phase production at no cost.

NON-WARRANTY ITEMS DURING WARRANTY PERIOD

Non-warranty replacements are also common, even while a vehicle is under the warranty period. An example of this would be a vehicle collision, which is not covered by warranty but rather is the SFMTA's responsibility to resolve. For this reason, the SFMTA keeps its own spare parts in addition to relying on Siemens for warranty parts. The LRV4 contract calls for one spare train set of all major subsystems as part

of the Phase 1 Expansion phase procurement. The contract also provides a price list for specialized spare parts to expedite procurement in the event additional parts are required as well as an allowance for unanticipated future needs.

In addition to these contractual mechanisms for obtaining parts, the SFMTA benefits from the geographic proximity to the Siemens manufacturing plant in Sacramento, CA. Siemens constant production of light rail vehicles and ongoing relationships with subcontractors can improve lead times on particularly specialized parts. This has been especially useful in quickly addressing some non-warranty failures.

CHANGE ORDERS

Change orders are directions to Siemens from the SFMTA to make an alteration to the proposed or agreed-to design. These costs are borne by the SFMTA. The change orders included in Phase 2 via Contract Mod 7 are as follows:

Table 1: Contract Mod. 7 Change Orders

Update	Description	Client/Beneficiary
Track Brakes Installation, Phase 2	Adding track brakes to all 151 Phase 2 vehicles to alleviate flat wheels.	Maintenance
Implementation of Interior Seating – Phase 1 Single Transverse	Seat changes, retrofits 68 Phase 1 vehicles with single transverse seating and related reconfigurations.	Passenger
Implementation of Interior Seating – Phase 2 Single Transverse	Seat changes, production of first 50 Phase 2 vehicles with single transverse seating and related reconfigurations.	Passenger
Implementation of Interior Seating – Phase 2 Double Transverse	Seat changes, production for 101 Phase 2 vehicles with double transverse seating and related reconfigurations.	Passenger
Lockable Convenience Outlet	A lockable cover will be added to the convenience outlet for all 219 Vehicles.	Maintenance/Operations
Televic Passenger Information System change items	Multiple Passenger Information System (PIS) enhancements to update the technology consistent with evolving needs and expectations.	Passenger
TDR6 HDD Unmounted	The TOD will display a message when the TDR6 HDD is unmounted to assist maintenance, troubleshooting, and verifying readiness for service for all 219 Vehicles.	Operations/Maintenance
Corner Hatch additional retention clips	The Corner Hatch will be modified to prevent it from quickly opening when unlocked for all 219 Vehicles.	Operations/Maintenance
Replace door touch strips with passenger door open PBs	On 151 Phase 2 vehicles only, each doorway shall have 'keep door open' push buttons instead of the touch strips	Passenger

Push to Close locking feature addition to exterior EDR door	The Exterior Manual Emergency Door Release access panel when include a locking feature when pushed closed for all 219 Vehicles.	Operations/ Maintenance
Pre-Wiring for Additional Clipper card readers	Wiring for additional Clipper card readers will be included on 151 Phase 2 Vehicles.	Passenger/ Operations
Provisions for ease of tire replacement	Wheel hubs specified in this change will be designed with a hole pattern for easier tire replacement and use with shop equipment on 151 Phase 2 Vehicles.	Maintenance
PIS 40 A pattern change	The Passenger Information System will be modified to allow remote and manual changes to information displays at any time.	Passenger/ Maintenance

DETAILED SUMMARY OF HIGH-PROFILE ITEMS THAT HAVE BEEN DISCUSSED PUBLICLY

Wheel Flat Spots/Track Brakes

Description

Light rail vehicles are equipped with wheels that contain a metal “tire” component. When the vehicle experiences a harsh stop, the tire can flatten out. While this does not pose a safety risk, a flattened tire will sound like a jackhammer as it rolls down the trackway, and in extreme cases, can cause undue wear to the track itself. It is practice to remove a vehicle with flattened wheels from service, which can negatively impact riders.

Issue

The design requirements levied upon Siemens required compliance with regulatory emergency brake rates and did not require specific technologies to achieve those rates. Siemens designed the vehicle to meet these requirements using industry standard solutions common in other municipalities. However, in SFMTA’s unique and challenging mixed-traffic conditions, Operators routinely use emergency braking. When the fleet was regularly used to support revenue service it became clear that the approved design using a single set of track brakes was not compatible with the operating environment and wheel flats were occurring at an unsustainable rate.

Resolution

To resolve this issue, the SFMTA initiated discussions with Siemens in 2018 to explore options for alterations to the track brake design. This new track brake design is included in the Mod 7 suite of change orders, it will be applied retroactively to the existing fleet of 68 expansion vehicles and will be incorporated into the production of the 151 Phase 2 replacement vehicles.

Cost and Funding

Because this is an operations and behavior issue, and not a mechanical fault or flaw, the SFMTA bears the full cost of this redesign and retrofit. The total cost associated with this change is \$5.1M. The SFMTA has already executed two contract modifications to begin design and procurement of this update. Mod 5 contributed \$470,000 and Mod 6 \$1.7M to this work. Mod 7, which is the subject of this request, will provide the final \$2.9M required.

Cameras/Monitors

Description

In developing the design of the vehicle, Siemens had to contend with significant grades and turns within the SFMTA light rail system. They proposed the application of rear-view camera monitors in place of physical external mirrors to reduce the amount of limited space given over to these external protrusions. Operators can view the exterior of the vehicle from a monitor in the cab rather than looking at the rear mirrors. Rear view monitors are used across the globe and are a relatively new, but not novel design feature.

Issue

In conversations with operators, through anonymous feedback, and in communications with the operators' union, it became clear that many operators felt the screens were too small to view the exterior of the vehicle. The LRV4 Project Team has worked with Siemens to prototype new and different monitors, which have a "pinch and zoom" feature that allow operators to zoom in on any camera view they would like to see more closely.

Resolution

Through several rounds of prototyping, the SFMTA has identified desired updates. However, to date, there remain refinements required with each of the prototypes. It was our intention to include an updated camera design to this Mod 7 suite of change orders. However, because the final design has not been determined, it will be held to a future, independent modification. There is no debate regarding the need for an updated camera configuration. However, it is essential all parties agree to the final design before it is executed.

Cost and Funding

Until the final design is selected, we will not have a cost estimate for this item.

Seats

Description

The SFMTA performed extensive outreach in 2014 ahead of the bid and award of the LRV4 contract, reaching more than 1,400 riders and asking their preferences across several design factors. This survey indicated approximately half of riders preferred side-running or *longitudinal* seating configuration, while the other half preferred front/back-facing or *transverse* seating configuration like the design on the Breda vehicles. The SFMTA determined to pursue a longitudinal design that also utilized benches rather than articulated individual seating. This is a common application in major cities world-wide and can improve the standing capacity and ease of access to the vehicles through wider aisles.

Issue

In early 2019, the SFMTA conducted a second survey of riders to identify areas of improvement. The new vehicles had been deployed system-wide for several months, and riders had become familiar with the new features. This on-board survey identified general apathy with the seating design, more specifically with the seating height and with the bench design. In a narrower focus group setting, and in follow up conversations with rider advocacy groups, it became clear that a group of riders, disproportionately those with mobility disabilities, had significantly higher rates of dissatisfaction with the seating design on board the vehicles.

To address their feedback, the SFMTA worked with Siemens to develop updated seating configurations, which were presented to numerous advocacy groups and publicly at both the SFMTA and SFCTA Board meetings.

Resolution

The SFMTA determined that an updated seating design that reintroduced the individual-style seating and added in transverse seating options would address the concerns raised during this secondary outreach. There will ultimately be two seating configurations with the 68 expansion vehicles and the first 50 replacement vehicles equipped with what is referred to as the *single transverse* design. The final 101 replacement vehicles will be equipped with the *double transverse* design.

Cost and Funding

During the development of the Phase 2 contract modification budget and funding plan, the SFMTA identified the need for some interior configuration updates to address public feedback. The cost estimate used in the discussions that occurred between spring 2018 and early 2019 did not account for the extensive change that was selected. The cost of these changes is a total of \$18.3M, this is broken down as follows:

- Retrofit (68): \$7.6M
- Single Transverse (50): \$2.3M
- Double Transverse (101): \$7.5M

Contract Mod 6 provided initial funding of approximately \$870,000 to begin design work on required for this change to move forward. Mod 7 will provide the remaining \$17.5M in funding.

PROJECT COST UPDATE BETWEEN APRIL 2019 and MARCH 2020

The total project cost inclusive of Contract Mod. 7 is \$1,126,960,331. Mod. 7 represents an increase in previously approved funding to account for three primary activities:

1. Change orders (as described above)
2. Accelerated production and delivery schedule
3. Escalation per the contract requirements

In April 2018, the SFMTA planned to initiate Phase 2, and provided a project budget of \$1,112,450,192. This current proposal represents a \$14,510,140 increase in the total cost. The primary driver of this increase was the final design selected for the seating retrofits, which were more substantial than previously anticipated. Approximately \$10M in this increase is attributable the cost of these changes above and beyond the estimate used to formulate the April 2019 budget. During the interim period, the escalation on the project has continued to fluctuate. We budgeted approximately \$4M in increased escalation costs due to changes in the macroeconomic indicators utilized in the calculation of escalation during this interim period.

These costs will be covered by MTC and the SFMTA under an agreement based on the rules established by the Transit Capital Priorities policies at a rate of approximately \$5.9M and \$8.6M respectively. This change is included in the overall project budget and funding plan.

San Francisco County Transportation Authority

Prop K/Prop AA Allocation Request Form

FY of Allocation Action:	FY2019/20
Project Name:	Light Rail Vehicle Procurement
Grant Recipient:	San Francisco Municipal Transportation Agency

ENVIRONMENTAL CLEARANCE

Environmental Type:	EIR/EIS
----------------------------	---------

PROJECT DELIVERY MILESTONES

Phase	Start		End	
	Quarter	Calendar Year	Quarter	Calendar Year
Planning/Conceptual Engineering				
Environmental Studies (PA&ED)				
Right of Way				
Design Engineering (PS&E)				
Advertise Construction	Jul-Aug-Sep	2013		
Start Construction (e.g. Award Contract)	Jul-Aug-Sep	2014		
Operations				
Open for Use			Jan-Feb-Mar	2026
Project Completion (means last eligible expenditure)			Oct-Nov-Dec	2026

SCHEDULE DETAILS

First replacement LRV will be placed in service in March 2021.
 Last replacement LRV will be placed in service in March 2026.
 See attached schedule for more details.

On June 19, 2014, the San Francisco Planning Department determined (Case Number 2014.0929E) that the Procurement of New Light Rail Vehicles is statutorily exempt from CEQA as defined in Title 14 of the California Code of Regulations Section 15275(a), which provides an exemption from environmental review for the institution or increase of passenger or commuter service on rail lines already in use.

The Central Subway Final Supplemental Environmental Impact Statement / Supplemental Environmental Impact Report (Central Subway SEIS/SEIR) evaluated the environmental impacts of an increase in passenger rail service associated with the Central Subway project, which some of the Light Rail Vehicles will service. On August 7, 2008, the San Francisco Planning Commission certified the Final SEIR (Case No. 1996.281E).

San Francisco County Transportation Authority

Prop K/Prop AA Allocation Request Form

FY of Allocation Action:	FY2019/20
Project Name:	Light Rail Vehicle Procurement
Grant Recipient:	San Francisco Municipal Transportation Agency

CURRENT PROP K REQUEST

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K: Purchase Additional LRV's	\$0	\$96,661	\$0	\$96,661
PROP K: Vehicles - MUNI	\$0	\$50,089,416	\$0	\$50,089,416
PROP K: Vehicles - Undesignated	\$0	\$10,545,950	\$0	\$10,545,950
Phases in Current Request Total:	\$0	\$60,732,027	\$0	\$60,732,027

FUNDING PLAN - ENTIRE PROJECT (ALL PHASES)

Fund Source	Planned	Programmed	Allocated	Project Total
PROP K	\$0	\$60,732,027	\$131,153,144	\$191,885,171
TIRCP	\$0	\$0	\$113,140,000	\$113,140,000
REVENUE BOND	\$0	\$0	\$145,050,650	\$145,050,650
REGIONAL MEASURE 3	\$7,122,556	\$0	\$0	\$7,122,556
OPERATING FUNDS	\$0	\$0	\$8,000,000	\$8,000,000
FTA OTHER	\$0	\$0	\$10,227,539	\$10,227,539
FTA FORMULA	\$0	\$516,648,275	\$0	\$516,648,275
CENTRAL SUBWAY (FTA, PTMISEA)	\$0	\$0	\$16,800,000	\$16,800,000
CCSF - ERAF ALLOCATION TO GENERAL FUND	\$0	\$19,000,000	\$19,247,904	\$38,247,904
BATA PROJECT SAVINGS	\$0	\$0	\$59,118,014	\$59,118,014
AB 664 BRIDGE TOLLS	\$0	\$20,720,222	\$0	\$20,720,222
Funding Plan for Entire Project Total:	\$7,122,556	\$617,100,524	\$502,737,251	\$1,126,960,331

**Light Rail Vehicle Procurement - 151 Replacement and 68 Expansion
Committed Funds**

Fund Source	March 2019	Current	Difference March '19 - Current	Status
MTC Funds				
FTA 5307/5337 funds, RM3 Fund Exchange	\$ 397,329,679	\$ 516,648,275	\$ 119,318,596	Committed per MTC Reso 4123, approved 12/18/13.
Regional Measure 3	\$ 108,435,990	\$ -	\$ (108,435,990)	Intent was to use RM3 funds, but more recent discussions with MTC indicated that Transit Capital Priority funds should be available to the project.
AB 664 Bridge Tolls	\$ 14,727,570	\$ 14,727,570	\$ -	Committed per MTC Resolution 4123, approved 12/18/13, Not allocated to date.
Bay Area Toll Authority (BATA) Project Savings	\$ 65,110,666	\$ 65,110,666	\$ -	Committed per MTC Resolution 4123, approved 12/18/13, \$59,118,014 allocated.
MTC Subtotal	\$ 585,603,905	\$ 596,486,511	\$ 10,882,606	

SFMTA Funds				
Prop K (151 replacement vehicles)	\$ 189,328,294	\$ 187,196,020	\$ (2,132,274)	Committed: \$126,560,654 allocated on 10/21/2014; \$60,635,366 request pending. ¹
Prop K (24 expansion vehicles)	\$ 4,592,490	\$ 4,689,150	\$ 96,660	Committed: \$4,592,490 allocated by SFCTA 10/21/2014, fully expended. \$96,661 request pending. ¹
Regional Measure 3 (RM3)	\$ -	\$ 7,122,556	\$ 7,122,556	This could be an exchange ²
Revenue Bond	\$ 145,050,650	\$ 145,050,650	\$ -	Committed per SFMTAB approval of SFMTA revenue bond series 2013, 2014 and 2017
TIRCP	\$ 113,140,000	\$ 113,140,000	\$ -	Committed per California Transportation Commission Master Agreement No. 64SFMTAMA
Educational Revenue Augmentation Fund (ERAF)	\$ 19,247,904	\$ 19,247,904	\$ -	Committed per City and County of San Francisco Ordinance 34-19, approved 2/26/19
Central Subway	\$ 16,800,000	\$ 16,800,000	\$ -	Committed/fully expended (\$10.08 million in FTA funds, \$6.72 million in PTMISEA funds)
Other - FTA §5307 (Old FTA transfer)	\$ 10,227,539	\$ 10,227,539	\$ -	Fully expended. See MTC Funding section above.
SFMTA Operating	\$ 8,000,000	\$ 8,000,000	\$ -	Committed/ fully expended
Educational Revenue Augmentation Fund (ERAF) Backfill	\$ 20,459,409	\$ 19,000,000	\$ (1,459,409)	See attached letter from Leo Levenson, dated 3/19/2019, stating that these funds are committed to the project. SFMTA will determine an SFMTA controlled fund source (e.g. Transportation Sustainability Fee, General Fund, MTA Operating) before the SFMTA Board approves the contract modifications to accelerate procurement, anticipated March 2020.
SFMTA Subtotal	\$ 526,846,286	\$ 530,473,819	\$ 3,627,533	
Total Funding	\$ 1,112,450,192	\$ 1,126,960,330	\$ 14,510,138	The SFMTA will bear \$5.9 M of the increased cost and MTC will bear \$8.5 M from the Transit Capital Priorities program (which includes FTA and AB 664 Bridge Toll match).

Expenditure Plan	Amount
EP 15	\$96,661
EP 17M	\$50,089,416
EP 17U	\$10,545,950
TOTAL	\$60,732,027

¹ Current allocation includes Prop K 5YPP Funding as follows:

² If RM3 does not clear remaining legal hurdles, SFMTA is responsible for identifying an alternate fund source.

REPLACEMENT LRVs	Local / MTC Split (75% MTC Max)	
	Amounts	Percentage
Local (non-TCP)	\$ 198,828,835	25.0%
MTC (TCP)	\$ 596,486,511	75.0%
Total	\$ 795,315,346	100.0%

This is consistent with MTC Res 4123 commitment to bear 75% of replacement car cost.

March 19, 2019

Tilly Chang, Executive Director
San Francisco County Transportation Authority
1455 Market St., 22nd Floor
San Francisco, CA 94103

RE: Light Rail Vehicle Procurement: Allocation Request and Funding Commitment

Dear Ms. Chang,

On February 5, 2019, the San Francisco Municipal Transportation Agency (SFMTA) Board of Directors supported a supplemental appropriation to the SFMTA Capital Budget to fund the acceleration of the purchase of Light Rail Vehicles (LRVs) for the Muni Transit Fleet.

Subsequently on February 25, 2019, the SFMTA submitted an Allocation Request Form (ARF) to the San Francisco County Transportation Authority (SFCTA) to allocate \$62.8 million in Proposition K sales tax dollars for LRVs. As part of the ARF submittal, SFMTA included the full funding plan for the accelerated project of \$1.1 billion including \$20.5 million in planned SFMTA controlled funds.

This letter serves as SFMTA's commitment to fully fund the project, including the \$20.5 million. The source of those funds may include Transit Sustainability Fee revenues, future General Fund SFMTA baseline transfer as a result of extra property tax the City is receiving due to reaching an Educational Revenue Augmentation Fund (ERAF) formula cap, or another source subject to approval of the SFMTA Board of Directors.

Further, the Federal Transit Administration (FTA) formula funds originally anticipated to fund the project may not be available in time to meet the project's cash flow needs. Regional Measure 3 funds are planned to be used to bridge those cash flow gaps, beginning in 2022. In the event Regional Measure 3 funds are not available, financing against federal funds will be required. SFMTA and the Metropolitan Transportation Commission (MTC) have agreed to request a letter of no prejudice against future federal funds in order to allow either MTC or SFMTA to finance against the FTA formula funds.

We look forward to working with the SFCTA and other project partners to deliver this project.

Sincerely,

Leo Levenson
Leo Levenson
Chief Financial Officer

cc: Jonathan Rewers, Senior Manager, Budget, Financial Planning and Analysis

COST SUMMARY

Phase	Total Cost	Prop K - Current Request	Source of Cost Estimate
Planning/Conceptual Engineering	\$0	\$0	
Environmental Studies (PA&ED)	\$0	\$0	
Right of Way	\$0	\$0	
Design Engineering (PS&E)	\$0	\$0	
Construction (CON)	\$1,126,960,331	\$60,732,027	negotiated contract with vendor + engineer's estimate
Operations	\$0	\$0	
Total:	\$1,126,960,331	\$60,732,027	

% Complete of Design:	100.0%
As of Date:	09/30/2014
Expected Useful Life:	25 Years

SFMTA LRV Procurement - Funding and Cashflow
151 Replacement & 68 Expansion LRVs

Expenses	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	Total
68 Expansion	8,290,038	52,955,713	170,916,599	39,143,877	59,764,468	-	574,288	-	-	-	-	331,644,983
151 Replacement	6,568,322	15,696,363	5,633,420	19,905,041	29,522,756	100,580,220	116,331,020	118,291,332	147,829,822	155,609,307	79,347,744	795,315,348
Total	14,858,360	68,652,076	176,550,019	59,048,918	89,287,224	100,580,220	116,905,308	118,291,332	147,829,822	155,609,307	79,347,744	1,126,960,331
Cum. Expenses	14,858,360	83,510,436	260,060,455	319,109,373	408,396,597	508,976,817	625,882,125	744,173,457	892,003,279	1,047,612,587	1,126,960,331	

Revenues	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	Total
MTC												
FTA Formula	-	-	-	-	13,220,000	-	113,635,101	67,336,982	89,571,273	153,537,174	79,347,744	516,648,275
RM3/FTA Swap	-	-	-	-	-	-	-	-	-	-	-	-
Bridge Tolls	-	-	-	59,118,014	-	20,720,222	-	-	-	-	-	79,838,236
Fund Exchange	-	-	-	-	-	-	-	-	-	-	-	-
Total MTC	-	-	-	59,118,014	13,220,000	20,720,222	113,635,101	67,336,982	89,571,273	153,537,174	79,347,744	596,486,511

SFMTA												
Prop K (151 replacement vehicles)	-	-	-	-	-	72,737,442	9,271,657	46,988,501	58,161,888	36,532	-	187,196,020
Rev Bond	15,725,564	11,512,539	117,812,547	-	-	-	-	-	-	-	-	145,050,650
CCSF - ERAF	-	-	-	19,247,904	-	-	-	-	-	-	-	19,247,904
Prop K (68 expansion vehicles)	-	3,092,490	1,500,000	-	-	-	96,661	-	-	-	-	4,689,151
Central Subway	-	-	13,000,000	3,800,000	-	-	-	-	-	-	-	16,800,000
Operating	8,000,000	-	-	-	-	-	-	-	-	-	-	8,000,000
Other - FTA 53307	10,227,539	-	-	-	-	-	-	-	-	-	-	10,227,539
TIRCP	41,181,000	-	45,092,000	26,867,000	-	-	-	-	-	-	-	113,140,000
RM3	-	-	-	-	-	7,122,556	-	-	-	-	-	7,122,556
ERAF Backfill	-	-	-	-	19,000,000	-	-	-	-	-	-	19,000,000
Total SFMTA	75,134,103	14,605,029	177,404,547	49,914,904	19,000,000	79,859,998	9,368,318	46,988,501	58,161,888	36,532	-	530,473,820
Total Funding	75,134,103	14,605,029	177,404,547	109,032,918	32,220,000	100,580,220	123,003,419	114,325,483	147,733,161	153,573,706	79,347,744	1,126,960,331

Cumulative Revenues	75,134,103	89,739,132	267,143,679	376,176,597	408,396,597	508,976,817	631,980,236	746,305,719	894,038,880	1,047,612,587	1,126,960,331	
----------------------------	-------------------	-------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	--------------------	----------------------	----------------------	--

Annual Balance	60,275,743	(54,047,047)	854,528	49,984,000	(57,067,224)	-	6,098,111	(3,965,849)	(96,661)	(2,035,601)	-	-
----------------	------------	--------------	---------	------------	--------------	---	-----------	-------------	----------	-------------	---	---

Cum. Balance	60,275,743	6,228,696	7,083,224	57,067,224	-	-	6,098,111	2,132,262	2,035,601	(0)	(0)	(0)
--------------	------------	-----------	-----------	------------	---	---	-----------	-----------	-----------	-----	-----	-----

Unfunded Need	0	0	0	0	0	0	0	0	0	0	0	(0)
----------------------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	------------

Green highlighted: Prop K cash flow as revised per proposed Strategic Plan amendment

MAJOR LINE ITEM BUDGET FEBRUARY 10, 2020 Light Rail Vehicle Procurement - 151 LRVs Replacement and 68 Expansion

REPLACEMENT VEHICLES (151 LRVs)	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	Total
Contract Payment Schedule	\$ -	\$ -	\$ -	\$ -	\$ 10,000,000	\$ 25,249,803	\$ 71,183,020	\$ 94,529,930	\$ 97,806,224	\$ 122,750,800	\$ 127,858,314	\$ 63,723,745	\$ 613,101,837
Project Development Cost Share* (219)	\$ 174,849	\$ 6,393,473	\$ 15,696,363	\$ 3,491,927	\$ 8,680,041	\$ 831,096	\$ -	\$ 1,175,352	\$ -	\$ -	\$ -	\$ -	\$ 36,443,101
Project Development Cost Share~ (175)	\$ -	\$ -	\$ -	\$ 2,141,493	\$ -	\$ 348,756	\$ 14,064,123	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 16,554,372
Contract Subtotal	\$ 174,849	\$ 6,393,473	\$ 15,696,363	\$ 5,633,420	\$ 18,680,041	\$ 26,429,655	\$ 85,247,143	\$ 95,705,282	\$ 97,806,224	\$ 122,750,800	\$ 127,858,314	\$ 63,723,745	\$ 666,099,310
Other Costs													
Support Costs (7.5%)*	\$ -	\$ -	\$ -	\$ -	\$ 725,000	\$ 1,830,611	\$ 6,138,753	\$ 6,797,118	\$ 6,921,963	\$ 8,600,435	\$ 8,933,355	\$ 4,461,129	\$ 44,408,364
Taxes (8.75%)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,960,701	\$ 9,140,952	\$ 8,789,377	\$ 10,547,252	\$ 12,656,703	\$ 8,086,227	\$ 54,181,212
Contingency (5%)	\$ -	\$ -	\$ -	\$ -	\$ 500,000	\$ 1,262,490	\$ 4,233,623	\$ 4,687,668	\$ 4,773,768	\$ 5,931,335	\$ 6,160,935	\$ 3,076,641	\$ 30,626,460
Other Costs Subtotal	\$ -	\$ -	\$ -	\$ -	\$ 1,225,000	\$ 3,093,101	\$ 15,333,077	\$ 20,625,738	\$ 20,485,108	\$ 25,079,022	\$ 27,750,993	\$ 15,623,997	\$ 129,216,036
Cash Need (Grand Total)	\$ 174,849	\$ 6,393,473	\$ 15,696,363	\$ 5,633,420	\$ 19,905,041	\$ 29,522,756	\$ 100,580,220	\$ 116,331,020	\$ 118,291,332	\$ 147,829,822	\$ 155,609,307	\$ 79,347,742	\$ 795,315,346
Tentative LRV Delivery Schedule**					15	26	25	32	36	17			151 LRVs
EXPANSION VEHICLES (68 LRVs)													
Contract Payment Schedule	\$ 3,764,038	\$ 427,650	\$ 39,588,455	\$ 148,714,904	\$ 32,168,414	\$ 54,337,701	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 279,001,162
Project Development Cost Share* (219)	\$ 233,132	\$ 2,879,180	\$ 7,068,561	\$ 1,572,523	\$ 3,908,892	\$ 655,306	\$ -	\$ 529,298	\$ -	\$ -	\$ -	\$ -	\$ 16,846,892
Project Development Cost Share~ (175)	\$ -	\$ -	\$ -	\$ 340,370	\$ -	\$ 97,055	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 437,425
Contract Subtotal	\$ 3,997,170	\$ 3,306,830	\$ 46,657,016	\$ 150,627,797	\$ 36,077,306	\$ 55,090,062	\$ -	\$ 529,298	\$ -	\$ -	\$ -	\$ -	\$ 296,285,479
Other Costs													
Support Costs (7.5%)*	\$ 199,858	\$ 165,341	\$ 2,332,851	\$ 7,514,371	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 10,212,421
Taxes (8.75%)	\$ 339,759	\$ 281,080	\$ 3,965,846	\$ 12,774,431	\$ 3,066,571	\$ 4,674,406	\$ -	\$ 44,990	\$ -	\$ -	\$ -	\$ -	\$ 25,147,083
Contingency (5%)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other Costs Subtotal	\$ 539,617	\$ 446,421	\$ 6,298,697	\$ 20,288,802	\$ 3,066,571	\$ 4,674,406	\$ -	\$ 44,990	\$ -	\$ -	\$ -	\$ -	\$ 35,359,504
Cash Need (Grand Total)	\$ 4,536,787	\$ 3,753,251	\$ 52,955,713	\$ 170,916,599	\$ 39,143,877	\$ 59,764,468	\$ -	\$ 574,288	\$ -	\$ -	\$ -	\$ -	\$ 331,644,983
LRV Delivery Schedule					1	27	40						68 LRVs
Total Net Cash Flow*	\$ 4,711,636	\$ 10,146,724	\$ 68,652,076	\$ 176,550,019	\$ 59,048,918	\$ 89,287,224	\$ 100,580,220	\$ 116,905,308	\$ 118,291,332	\$ 147,829,822	\$ 155,609,307	\$ 79,347,742	\$ 1,126,960,329

*Positive total net cash flow indicates expected savings

San Francisco County Transportation Authority Prop K/Prop AA Allocation Request Form

FY of Allocation Action:	FY2019/20
Project Name:	Light Rail Vehicle Procurement
Grant Recipient:	San Francisco Municipal Transportation Agency

SFCTA RECOMMENDATION

Resolution Number:		Resolution Date:	
Total Prop K Requested:	\$60,732,027	Total Prop AA Requested:	\$0
Total Prop K Recommended:	\$60,732,027	Total Prop AA Recommended:	\$0

SFCTA RECOMMENDATION

SGA Project Number:	117-910abc	Name:	Light Rail Vehicle Procurement - EP-17M
Sponsor:		Expiration Date:	12/31/2026
Phase:	Construction	Fundshare:	17.02

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24 +	Total
PROP K EP-117M	\$0	\$0	\$17,183,425	\$0	\$0	\$32,905,991	\$50,089,416

Deliverables

1. By September 1, 2020 SFMTA will provide a plan describing the preventative maintenance program for the Siemens light rail vehicles procured in Phases 1 and 2. This plan will address replacement of components or sub-components that will need to occur in advance of the vehicle's midlife overhaul, including cost and schedule. The preventative maintenance plan shall meet or exceed the original equipment manufacturer specifications outlined by Siemens. The plan will identify replacement parts with a long lead time for procurement and will provide the estimated lead time.

Special Conditions

1. Recommended allocation is contingent on an amendment to the Prop K Strategic Plan and 5-Year Prioritization Program to advance \$17,183,425 in cash flow from FY2021/22 to FY2020/21 in the Vehicles – Muni category. See attached Strategic Plan amendment for details. See Attachment 1: Strategic Plan and 5YPP Amendments for details.
2. Reimbursement of the first \$31,457,114 in Prop K funds is conditioned upon the Phase 1 vehicles passing the Reliability Demonstration Test that demonstrates 25,000-miles Mean Distance Between Failures for a period of 6 consecutive months. See Attachment 2: SFMTA LRV4 Mean Distance Between Failures.
3. The recommendation is conditioned upon implementation of the attached Project Management Oversight Protocol for Siemens Light Rail Vehicle Procurement (Attachment 3), as funded by the subject request and previous Prop K allocations (SGAs 115-910002, 117-910054 and 117-910055).
4. The recommended allocation is contingent upon a commitment by the SFMTA to ensuring that warranty repairs and requirements of Contract Modifications 5-7 (covering the modifications for safety, design and performance) are included in Phase 2 vehicles.
5. Monthly progress reports may be calendared on a regular basis on the Transportation Authority Board and/or CAC meeting agendas, at the discretion of the Board Chair and Executive Director. Project updates may be consent items or discussion items with presentation by SFMTA staff. In either case SFMTA staff shall be in attendance to present or answer questions from Board and CAC members, if requested.
6. The recommended allocation is contingent upon a commitment by the SFMTA to maintain the 219 LRVs in a state of good repair, including a mid-life overhaul program providing that funding is available to allow them to meet expectations for their useful lives per FTA guidelines.
7. The Transportation Authority will only reimburse SFMTA up to the approved overhead multiplier rate for the fiscal year that SFMTA incurs charges.

Notes

1. Funds from the Vehicles-Muni category (EP-17M) are eligible only for purchase of replacement transit vehicles.

SGA Project Number:		Name:	Light Rail Vehicle Procurement - EP-17U
Sponsor:	San Francisco Municipal Transportation Agency	Expiration Date:	12/31/2026
Phase:	Construction	Fundshare:	17.02

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	Total
PROP K EP-117U	\$0	\$0	\$3,965,843	\$0	\$6,580,107	\$10,545,950

Deliverables

1. See Deliverable 1 for Light Rail Vehicle Procurement - EP-17M (SGA 117-910abc)

Special Conditions

1. Recommended allocation is contingent on an amendment to the Prop K Strategic Plan and 5-Year Prioritization Program to advance \$3,965,843 in cash flow from FY2022/23 to FY2020/21 in the Vehicles – Undesignated category. See attached Strategic Plan amendment for details.

2 - 7: See Special Conditions 2 – 7 for Light Rail Vehicle Procurement – EP-17M (SGA 117-910abc)

Notes

1. Funds from the Vehicles-Undesignated category (EP-17U) are eligible only for purchase of replacement transit vehicles. Any project cost savings will be returned to the Vehicles-Undesignated category for future allocation.

SGA Project Number:		Name:	Light Rail Vehicle Procurement - EP-15
Sponsor:	San Francisco Municipal Transportation Agency	Expiration Date:	12/31/2023
Phase:		Fundshare:	17.02

Cash Flow Distribution Schedule by Fiscal Year

Fund Source	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2024/25 +	Total
PROP K EP-115	\$0	\$0	\$0	\$96,661	\$0	\$0	\$96,661

Deliverables

1. See Deliverable 1 for SGA 117-910abc

Special Conditions

1. Recommended allocation is contingent on an amendment to the Prop K Strategic Plan and 5-Year Prioritization Program to advance \$96,661 in cash flow from FY2023/24 to FY2021/22 in the Purchase Additional Light Rail Vehicles category. See attached Strategic Plan amendment for details.

2 - 7: See Special Conditions 2 - 7 for Light Rail Vehicle Procurement - EP-17M (SGA 117-910abc)

Notes

1. Funds from the Purchase Additional Light Rail Vehicles (EP-15) category are eligible only for purchase of vehicles for the expansion of SFMTA's transit fleet.

Metric	Prop K	Prop AA
Actual Leveraging - Current Request	0.0%	No Prop AA
Actual Leveraging - This Project	82.97%	No Prop AA

San Francisco County Transportation Authority Prop K/Prop AA Allocation Request Form

FY of Allocation Action:	FY2019/20
Project Name:	Light Rail Vehicle Procurement
Grant Recipient:	San Francisco Municipal Transportation Agency

EXPENDITURE PLAN INFORMATION

Current Prop K Request:	\$60,732,027
--------------------------------	--------------

1) The requested sales tax and/or vehicle registration fee revenues will be used to supplement and under no circumstance replace existing local revenues used for transportation purposes.

Initials of sponsor staff member verifying the above statement
JCG

CONTACT INFORMATION

	Project Manager	Grants Manager
Name:	Janet Gallegos	Joel C Goldberg
Title:	Project Manager	Grants Procurement Manager
Phone:	(415) 579-9791	(415) 646-2520
Email:	janet.gallegos@sfmta.com	joel.goldberg@sfmta.com

**2019 Prop K Strategic Plan
Attachment 1a: Proposed Amendment 4
Programming and Finance Costs Over the Life of the Expenditure Plan**

Approved (as Amended)

EP No.	EP Line Item	Total Available Funds	Percent of Available Funds Spent on Financing	Total Programming & Finance Costs	FY2018/19	FY2019/20	FY2020/21	FY2021/22	FY2022/23	FY2023/24
15	Purchase Additional Light Rail Vehicles	\$ 5,677,512	14.83%	Programming \$ 4,694,972	-	\$ 96,661	-	-	-	-
		Finance Costs \$ 842,227		\$ 61,143	\$ 77,691	\$ 71,079	\$ 65,342	\$ 84,845		
		Total \$ 5,537,199		\$ 61,143	\$ 77,691	\$ 71,079	\$ 65,342	\$ 84,845		
17M	New and Renovated Vehicles-MUNI	\$ 475,013,647	13.01%	Programming \$ 411,420,696	\$ 33,320,938	\$ 56,616,219	-	\$ 3,304,749	-	-
		Finance Costs \$ 61,811,286		\$ 1,560,806	\$ 4,291,656	\$ 4,665,755	\$ 5,098,603	\$ 4,639,231	\$ 7,248,296	
		Total \$ 473,231,982		\$ 34,881,744	\$ 60,907,875	\$ 4,665,755	\$ 8,403,352	\$ 4,639,231	\$ 7,248,296	
17U	New and Renovated Vehicles-Discretionary	\$ 84,833,275	9.03%	Programming \$ 76,990,293	-	\$ 10,545,950	-	-	-	-
		Finance Costs \$ 7,662,760		-	-	-	-	\$ 153,367	\$ 1,327,124	
		Total \$ 84,653,053		-	\$ 10,545,950	-	-	\$ 153,367	\$ 1,327,124	

Proposed Amendment 4

EP No.	EP Line Item	Total Available Funds	Percent of Available Funds Spent on Financing	Total Programming & Finance Costs	FY2018/19	FY2019/20	FY2020/21	FY2021/22	FY2022/23	FY2023/24
15	Purchase Additional Light Rail Vehicles	\$ 5,678,874	15.35%	Programming \$ 4,694,972	-	\$ 96,661	-	-	-	-
		Finance Costs \$ 871,842		\$ 61,143	\$ 92,768	\$ 76,155	\$ 72,337	\$ 93,491	\$ 77,684	
		Total \$ 5,566,814		\$ 61,143	\$ 189,429	\$ 76,155	\$ 72,337	\$ 93,491	\$ 77,684	
17M	New and Renovated Vehicles-MUNI	\$ 475,127,651	13.14%	Programming \$ 411,420,696	\$ 33,320,938	\$ 56,616,219	-	\$ 3,304,749	-	-
		Finance Costs \$ 62,432,775		\$ 1,560,806	\$ 3,392,605	\$ 5,204,154	\$ 4,924,625	\$ 6,265,055	\$ 6,581,147	
		Total \$ 473,853,471		\$ 34,881,744	\$ 60,008,824	\$ 5,204,154	\$ 8,229,374	\$ 6,265,055	\$ 6,581,147	
17U	New and Renovated Vehicles-Discretionary	\$ 84,853,635	8.89%	Programming \$ 76,990,293	-	\$ 10,545,950	-	-	-	-
		Finance Costs \$ 7,544,092		-	-	-	-	\$ 209,171	\$ 1,198,461	
		Total \$ 84,534,385		-	\$ 10,545,950	-	-	\$ 209,171	\$ 1,198,461	

2019 Prop K Strategic Plan
Proposed Amendment 4
Programming and Finance Costs Over the Life of the Expenditure Plan

Change																
EP No.	EP Line Item	Total Available Funds	Percent of Available Funds Spent on Financing	Total Programming & Finance Costs	FY2018/19	FY2019/20	FY2020/21	FY2021/22	FY2022/23	FY2023/24						
15	Purchase Additional Light Rail Vehicles	\$ 1,363	0.52%	<table border="1"> <tr> <td>Programming</td> <td>\$ -</td> </tr> <tr> <td>Finance Costs</td> <td>\$ 29,615</td> </tr> <tr> <td>Total</td> <td>\$ 29,615</td> </tr> </table>	Programming	\$ -	Finance Costs	\$ 29,615	Total	\$ 29,615	-	-\$ (739)	-\$ (1,536)	-\$ 1,258	-\$ 28,149	-\$ (7,161)
Programming	\$ -															
Finance Costs	\$ 29,615															
Total	\$ 29,615															
17M	New and Renovated Vehicles-MUNI	\$ 114,005	0.13%	<table border="1"> <tr> <td>Programming</td> <td>\$ -</td> </tr> <tr> <td>Finance Costs</td> <td>\$ 621,489</td> </tr> <tr> <td>Total</td> <td>\$ 621,489</td> </tr> </table>	Programming	\$ -	Finance Costs	\$ 621,489	Total	\$ 621,489	-	-\$ (899,051)	\$ 538,399	-\$ (173,978)	\$ 1,625,824	-\$ (667,149)
Programming	\$ -															
Finance Costs	\$ 621,489															
Total	\$ 621,489															
17U	New and Renovated Vehicles-Discretionary	\$ 20,360	-0.14%	<table border="1"> <tr> <td>Programming</td> <td>\$ -</td> </tr> <tr> <td>Finance Costs</td> <td>\$ (118,668)</td> </tr> <tr> <td>Total</td> <td>\$ (118,668)</td> </tr> </table>	Programming	\$ -	Finance Costs	\$ (118,668)	Total	\$ (118,668)	-	-\$ -	-\$ -	-\$ -	-\$ 55,805	-\$ (128,663)
Programming	\$ -															
Finance Costs	\$ (118,668)															
Total	\$ (118,668)															

Total Available Funds	Total Programming & Finance Costs
-----------------------	-----------------------------------

TOTAL STRATEGIC PLAN - Approved (as Amended)	\$ 2,793,550,460	9.23%	<table border="1"> <tr> <td>Programming</td> <td>\$ 2,476,995,707</td> </tr> <tr> <td>Finance Costs</td> <td>\$ 257,916,896</td> </tr> <tr> <td>Total</td> <td>\$ 2,734,912,603</td> </tr> </table>	Programming	\$ 2,476,995,707	Finance Costs	\$ 257,916,896	Total	\$ 2,734,912,603
Programming	\$ 2,476,995,707								
Finance Costs	\$ 257,916,896								
Total	\$ 2,734,912,603								

TOTAL STRATEGIC PLAN - as Proposed	\$ 2,794,160,046	9.42%	<table border="1"> <tr> <td>Programming</td> <td>\$ 2,476,995,707</td> </tr> <tr> <td>Finance Costs</td> <td>\$ 263,248,357</td> </tr> <tr> <td>Total</td> <td>\$ 2,740,244,064</td> </tr> </table>	Programming	\$ 2,476,995,707	Finance Costs	\$ 263,248,357	Total	\$ 2,740,244,064
Programming	\$ 2,476,995,707								
Finance Costs	\$ 263,248,357								
Total	\$ 2,740,244,064								

TOTAL STRATEGIC PLAN - Change	\$ 609,586	0.1888%	<table border="1"> <tr> <td>Programming</td> <td>\$ -</td> </tr> <tr> <td>Finance Costs</td> <td>\$ 5,331,461</td> </tr> <tr> <td>Total</td> <td>\$ 5,331,461</td> </tr> </table>	Programming	\$ -	Finance Costs	\$ 5,331,461	Total	\$ 5,331,461
Programming	\$ -								
Finance Costs	\$ 5,331,461								
Total	\$ 5,331,461								

2019 Prop K Strategic Plan
Proposed Amendment 4
Programming and Finance Costs Over the Life of the Expenditure Plan

Approved (as Amended)

EP No.	EP Line Item	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29	FY2029/30	FY2030/31	FY2031/32	FY2032/33	FY2033/34
15	Purchase Additional Light Rail Vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 72,733	\$ 65,641	\$ 58,820	\$ 51,683	\$ 44,193	\$ 36,521	\$ 26,127	\$ 13,096	\$ -	\$ -
		\$ 72,733	\$ 65,641	\$ 58,820	\$ 51,683	\$ 44,193	\$ 36,521	\$ 26,127	\$ 13,096	\$ -	\$ -
17M	New and Renovated Vehicles-MUNI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 6,359,283	\$ 5,790,963	\$ 5,251,258	\$ 4,676,948	\$ 4,082,078	\$ 3,503,007	\$ 2,726,016	\$ 1,917,384	\$ -	\$ -
		\$ 6,359,283	\$ 5,790,963	\$ 5,251,258	\$ 4,676,948	\$ 4,082,078	\$ 3,503,007	\$ 2,726,016	\$ 1,917,384	\$ -	\$ -
17U	New and Renovated Vehicles-Discretionary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 1,144,513	\$ 1,040,906	\$ 942,401	\$ 840,151	\$ 734,353	\$ 631,806	\$ 494,326	\$ 353,813	\$ -	\$ -
		\$ 1,144,513	\$ 1,040,906	\$ 942,401	\$ 840,151	\$ 734,353	\$ 631,806	\$ 494,326	\$ 353,813	\$ -	\$ -

Proposed Amendment 4

EP No.	EP Line Item	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29	FY2029/30	FY2030/31	FY2031/32	FY2032/33	FY2033/34
15	Purchase Additional Light Rail Vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 71,926	\$ 65,351	\$ 59,065	\$ 52,488	\$ 45,593	\$ 38,581	\$ 28,886	\$ 16,568	\$ -	\$ -
		\$ 71,926	\$ 65,351	\$ 59,065	\$ 52,488	\$ 45,593	\$ 38,581	\$ 28,886	\$ 16,568	\$ -	\$ -
17M	New and Renovated Vehicles-MUNI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 6,228,752	\$ 5,701,947	\$ 5,204,686	\$ 4,675,022	\$ 4,127,015	\$ 3,596,694	\$ 2,872,470	\$ 2,097,796	\$ -	\$ -
		\$ 6,228,752	\$ 5,701,947	\$ 5,204,686	\$ 4,675,022	\$ 4,127,015	\$ 3,596,694	\$ 2,872,470	\$ 2,097,796	\$ -	\$ -
17U	New and Renovated Vehicles-Discretionary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$ 1,114,265	\$ 1,017,841	\$ 926,535	\$ 831,709	\$ 733,512	\$ 638,164	\$ 507,840	\$ 366,594	\$ -	\$ -
		\$ 1,114,265	\$ 1,017,841	\$ 926,535	\$ 831,709	\$ 733,512	\$ 638,164	\$ 507,840	\$ 366,594	\$ -	\$ -

**2019 Prop K Strategic Plan
Proposed Amendment 4
Programming and Finance Costs Over the Life of the Expenditure Plan**

Change											
EP No.	EP Line Item	FY2024/25	FY2025/26	FY2026/27	FY2027/28	FY2028/29	FY2029/30	FY2030/31	FY2031/32	FY2032/33	FY2033/34
15	Purchase Additional Light Rail Vehicles	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$(807)	\$(290)	245	806	1,400	2,060	2,759	3,472	-	-
		\$(807)	\$(290)	245	806	1,400	2,060	2,759	3,472	-	-
17M	New and Renovated Vehicles-MUNI	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$(130,531)	\$(89,016)	\$(46,572)	\$(1,926)	44,937	93,686	146,454	180,412	-	-
		\$(130,531)	\$(89,016)	\$(46,572)	\$(1,926)	44,937	93,686	146,454	180,412	-	-
17U	New and Renovated Vehicles-Discretionary	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
		\$(30,249)	\$(23,065)	\$(15,867)	\$(8,442)	\$(840)	6,358	13,515	12,781	-	-
		\$(30,249)	\$(23,065)	\$(15,867)	\$(8,442)	\$(840)	6,358	13,515	12,781	-	-

Attachment 1b: 3 5YPP Amendments
2019 Prop K 5-Year Project List (FY 2019/20 - FY 2023/24)
Vehicles - Muni (EP 17M)
Programming and Allocations to Date
 Pending March 24, 2020 Board

Agency	Project Name	Phase	Status	Fiscal Year					Total
				2019/20	2020/21	2021/22	2022/23	2023/24	
Carry Forward From 2014 5YPP									
SFMTA	Replace 30 30-foot Hybrid Diesel Motor Coaches ^{2,3}	CON	Programmed	\$0					\$0
SFMTA	Replace 85 40-Foot Trolley Coaches	CON	Programmed	\$7,542,844					\$7,542,844
2019 5YPP Programming and Allocations									
SFMTA	Rehabilitation of 5 Vintage Streetcars ²	CON	Allocated	\$700,788					\$700,788
SFMTA	Transit Vehicle Replacement or Rehabilitation - Placeholder ³	CON	Programmed	\$0					\$0
SFMTA	New Flyer Midlife Overhaul Phase 1 ³	CON	Allocated	\$17,937,483					\$17,937,483
SFMTA	Rehabilitate Historic & Milan Streetcars	CON	Programmed		\$3,304,749				\$3,304,749
SFMTA	Placeholder - Purchase or Rehab Muni Vehicles ⁴	ANY	Programmed	\$2,035,607					\$2,035,607
SFMTA	Light Rail Vehicle Procurement ^{1,4}	CON	Pending	\$50,089,416					\$50,089,416
Total Programmed in 2019 5YPP				\$78,306,138	\$3,304,749	\$0	\$0	\$0	\$81,610,887
Total Allocated and Pending				\$68,727,687	\$0	\$0	\$0	\$0	\$68,727,687
Total Unallocated				\$9,578,451	\$3,304,749	\$0	\$0	\$0	\$12,883,200
Total Programmed in 2019 Strategic Plan				\$78,306,138	\$3,304,749	\$0	\$0	\$0	\$81,610,887
Deobligated Funds				\$217,308	\$0	\$0	\$0	\$0	\$217,308
Cumulative Remaining Programming Capacity				\$217,308	\$217,308	\$217,308	\$217,308	\$217,308	\$217,308

Pending Allocation/Appropriation
 Board Approved Allocation/Appropriation

FOOTNOTES:

- ¹ Deobligation of SGA 117-910055 is required to allocate LRV funds as programmed. EP-17 funds may be used for replacement vehicles only.
- ² 5YPP amendment to accommodate allocation of \$700,788 for Rehabilitation of 5 Vintage Streetcars (Resolution 20-003, 7/23/2019):
Replace 30 30-foot Hybrid Diesel Motor Coaches: Reduced by \$700,788 in FY2018/19. SFMTA has deferred the project by at least two years.
Rehabilitation of 5 Vintage Streetcars: Added project with \$700,788 in FY2019/20.
- ³ To accommodate allocation of \$17,937,483 for New Flyer Midlife Overhaul Phase 1 (Resolution 20-009, 09/24/2019):
Replace 30 30-foot Hybrid Diesel Motor Coaches: Reduced by \$13,446,287 in FY2019/20. SFMTA has deferred the project by at least two years.
Transit Vehicle Replacement or Rehabilitation - Placeholder: Reduced from \$4,491,196 to \$0 in FY2019/20.
New Flyer Midlife Overhaul Phase 1: Added project with \$17,937,483 in FY2019/20.
- ⁴ Strategic Plan and 5YPP amendments to accommodate allocation of \$50,089,416 for Light Rail Vehicle Procurement (Resolution 20-0XX, 3/20/2021):
Light Rail Vehicle Procurement: Advance \$17,183,425 in cash flow from FY2021/22 to FY2020/21, reduce total amount by \$2,035,607 from FY2020/21 to FY2019/20.
Placeholder - Purchase or Rehab Muni Vehicles: Add placeholder with \$2,035,607 in FY2019/20 and cash flow in FY2023/24.

**2019 Prop K 5-Year Project List (FY 2019/20 - FY 2023/24)
Vehicles - Undesignated Category (EP 17U)
Programming and Allocations to Date**

Pending March 24, 2020 Board

Agency	Project Name	Phase	Status	Fiscal Year					Total
				2019/20	2020/21	2021/22	2022/23	2023/24	
SFMTA	Light Rail Vehicle Procurement ¹	CON	Pending	\$10,545,950					\$10,545,950
Total Programmed in 2019 5YPP				\$10,545,950	\$0	\$0	\$0	\$0	\$10,545,950
Total Allocated and Pending				\$10,545,950	\$0	\$0	\$0	\$0	\$10,545,950
Total Unallocated				\$0	\$0	\$0	\$0	\$0	\$0
Total Programmed in 2019 Strategic Plan				\$10,545,950	\$0	\$0	\$0	\$0	\$10,545,950
Deobligated Funds				\$0	\$0	\$0	\$0	\$0	\$0
Cumulative Remaining Programming Capacity				\$0	\$0	\$0	\$0	\$0	\$0
Pending Allocation/Appropriation									
Board Approved Allocation/Appropriation									

FOOTNOTES:

¹ Strategic Plan and 5YPP amendments to accommodate allocation of \$10,545,950 for Light Rail Vehicle Procurement (Resolution 20-0XX, xx/xx/2020).

Light Rail Vehicle Procurement: Advance \$3,965,843 in cash flow from FY2022/23 to FY2020/21;

**2019 Prop K 5-Year Project List (FY 2019/20 - FY 2023/24)
Purchase Additional Light Rail Vehicles (EP 15)
Programming and Allocations to Date**

Pending March 24, 2020 Board

Agency	Project Name	Phase	Status	Fiscal Year					Total
				2019/20	2020/21	2021/22	2022/23	2023/24	
Purchase Additional Light Rail Vehicles (EP 15)									
SFMTA	Light Rail Vehicle Procurement ²	PROC	Pending	\$96,661					\$96,661
Total Programmed in 2019 5YPP				\$96,661	\$0	\$0	\$0	\$0	\$96,661
Total Allocated and Pending				\$96,661	\$0	\$0	\$0	\$0	\$96,661
Total Unallocated				\$0	\$0	\$0	\$0	\$0	\$0
Total Programmed in 2019 Strategic Plan				\$96,661	\$0	\$0	\$0	\$0	\$96,661
Deobligated Funds				\$0	\$0	\$0	\$0	\$0	\$0
Cumulative Remaining Programming Capacity				\$0	\$0	\$0	\$0	\$0	\$0

Pending Allocation/Appropriation
Board Approved Allocation/Appropriation

FOOTNOTES:


² Strategic Plan and 5YPP amendments to the Purchase Additional Light Rail Vehicles category (EP-15) to accommodate allocation of \$96,661 for Light Rail Vehicle Procurement (Resolution 20-0XX, 3/24/2020).

Light Rail Vehicle Procurement: Advance \$96,661 in cash flow from FY2023/24 to FY2021/22; funds must be used for LRV fleet expansion, which will

SFMTA LRV4 Program

Funding Allocation Request

To: Anna Laforte, Deputy Director for Policy & Programming, SFCTA

From: Julie Kirschbaum, Director of Transit 

Cc: Jeffrey Tumlin, Director of Transportation
Janet Gallegos, Program Delivery and Support Manager

Date: February 19, 2020

Subject: SFMTA LRV4 Mean Distance Between Failures

This memo provides a summary of the Reliability Demonstration Test requirements for the LRV4 Contract, as well as an overview of SFMTA's contract authority to hold Siemens accountable to successfully complete the Program.

- The LRV4 Technical Specification requires the fleet to achieve a Mean Distance Between (Chargeable) Train Delays of 25,000 miles.
- Chargeable delays are defined as mechanical failures that are attributable to the design of the train and related ancillary systems, such as the radio. Service failures attributable to Operator or Mechanic actions, as well as send ins related to cleanliness or no defect found are excluded from this analysis.
- This Reliability Demonstration Test is a formal deliverable (CDRL 11) in the testing program.
- The Reliability Demonstration began in August 2018, as we needed enough vehicles in service to demonstrate a *long-term stable reliability*. For this reason, it is among the last tests performed.
- Siemens must demonstrate 25,000 miles for a period of six months and rework the vehicle/repeat the test until it is achieved.
- There are no penalties for not reaching the target; however, the deliverable is not achieved until it is accomplished.
- SFMTA is holding Phase 1 retention payments pending successful completion of the Reliability Demonstration Test.
- Although we anticipate reaching this milestone sooner, SFMTA will extend the retention hold to Phase 2 vehicles if the demonstration program extends into the Breda replacement process.
- SFMTA can also choose to not accept Phase 2 vehicles if the MDBF is not achieved by that time.

A summary of the retention payments is outlined in Table 1.

SFMTA LRV4 Program

Funding Allocation Request

Table 1. Summary of Retention Payments

Payment	Percent	Amount	Description
Currently Held		\$3,055,293	
Engineering and Test Item 1D	3%	\$337,870	Completion and acceptance of vehicle performance qualification testing
Engineering and Test Item 1E	8.6%	\$840,368	Completion of acceptance of test program
Engineering and Test Item 1F	5%	\$1,877,055	Completion and acceptance of all contract requirements
May be Withheld		\$28,401,821	
Phase 1 Retention: Vehicle Punchlist	3%	\$6,787,590	Retention for each vehicle until punch list items are completed
Retention on other Phase 1 items		\$3,051,706	Retention on change orders, manuals, etc.
Phase 2 Retention: Vehicle Punchlist	3%	\$18,562,525	Retention for each vehicle until punch list items are completed
Total Available Retention		\$31,457,114	

Attachment 3:
SFCTA Project Management Oversight (PMO) Protocol
for Siemens Light Rail Vehicle Procurement

Project Management Oversight (PMO) provides a proactive dialogue with the project sponsor while analyzing progress to provide the sponsor with professional opinions and recommendations for action. A critical component is to assess the reasonableness of the scope, schedule and cost, and assess the likelihood that the cost and schedule will hold through completion or revenue service. As part of its oversight, the San Francisco County Transportation Authority (SFCTA) PMO may identify problems and suggest solutions to the project sponsor.

The oversight approach described below is predicated on the shared goal of on-time, on-budget and successful delivery of the Siemens Light Rail Vehicle Procurement project (Project) and on the desire for an approach that is integrated into the Project Management Team's procedures and protocols rather than layering on an additional layer of oversight. The SFCTA PMO is both performing a traditional oversight role and serving as a resource to the Project Management Team.

1. The SFMTA-assigned project manager shall be available to the SFCTA PMO over the course of the project, providing requested documentation and facilitating discussions with members of the project team as requested.
2. The SFMTA shall submit monthly progress reports through the SFCTA's online grants portal (portal.sfcta.org). Monthly progress reports shall provide percent complete for the overall project scope, the number of vehicles received, the number of vehicles placed into revenue service, and total expenses incurred (not necessarily invoiced to Prop K) during the reporting period in the previous quarter. Progress reports shall include the most recent vehicle testing and commissioning data, including procurements pursuant to the base contract and any Prop K funded contract options. These reports should be comprehensive in nature and include a detailed description of issues of concern, root cause, proposed solution and status of repair/modifications including but not limited to data on average monthly miles of service, mean distance between failures, as well as any safety, contractual, operational, warranty findings/reports, etc.
3. The SFMTA project manager shall include the SFCTA PMO in internal and external meetings as requested by the SFCTA PMO and agreed to by the project manager, including meetings with vendor, subcontractors and/or consultants.
4. If the Federal Transit Administration (FTA) assigns a PMO contractor (PMOC) to the Project, the SFCTA PMO shall be notified and invited to attend all meetings with the FTA PMOC over the course of the project.
5. At SFCTA PMO discretion, the SFCTA PMO shall:
 - a. Review progress and cost reports and provide comments.
 - b. Participate in pre- and post-delivery vehicle assessment, including review of acceptance reports.
 - c. Participate in all risk workshops and risk management meetings, when scheduled to:
 - i. assess all the items that place the Project at risk as may be included in the risk register;
 - ii. update probability ratings and cost and schedule impacts; and
 - iii. discuss the status/progress of mitigation measures and add new risks as they become evident.
 - d. Participate in all SFMTA Transportation Capital Committee meetings at which scope, schedule, and budget changes to the Project are reviewed. The SFCTA PMO shall review proposed changes in advance of their submittal to the Transportation Capital Committee and provide comment and feedback. The SFMTA project manager or his/her designee shall provide the materials to the SFCTA PMO with a reasonable amount of time for review.
 - e. Review all safety certification processes and documents produced by or for the SFMTA, the state Public Utilities Commission or the FTA.
 - f. Review the test program and have the opportunity to be present for the testing of vehicle systems.