

File No. 241043

Committee Item No. 3

Board Item No. _____

COMMITTEE/BOARD OF SUPERVISORS

AGENDA PACKET CONTENTS LIST

Committee: Budget and Finance Committee Date November 13, 2024

Board of Supervisors Meeting Date _____

Cmte Board

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| <input type="checkbox"/> | <input type="checkbox"/> | Ordinance |
| <input type="checkbox"/> | <input type="checkbox"/> | Legislative Digest |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Budget and Legislative Analyst Report |
| <input type="checkbox"/> | <input type="checkbox"/> | Youth Commission Report |
| <input type="checkbox"/> | <input type="checkbox"/> | Introduction Form |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Department/Agency Cover Letter and/or Report |
| <input type="checkbox"/> | <input type="checkbox"/> | MOU |
| <input type="checkbox"/> | <input type="checkbox"/> | Grant Information Form |
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| <input checked="" type="checkbox"/> | <input type="checkbox"/> | Form 126 – Ethics Commission |
| <input type="checkbox"/> | <input type="checkbox"/> | Award Letter |
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OTHER (Use back side if additional space is needed)

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| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>CEQA Determination 1/22/2024</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>MTAB Resolution No. 241015-119 10/15/2024</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>CSC Approval w/Conditions 7/15/2024</u> |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <u>MTA Presentation 11/13/2024</u> |
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Completed by: Brent Jalipa Date November 7, 2024

Completed by: Brent Jalipa Date _____

1 [Contract Agreement - Hitachi Rail GTS USA Inc. - Design, Procurement, System
2 Implementation - \$212,093,633 - Support of a Train Control System - \$114,070,833 -
3 Extension Option of Support - \$237,681,185]

4 **Resolution approving an agreement between the City and County of San Francisco,**
5 **acting by and through the San Francisco Municipal Transportation Agency (SFMTA),**
6 **and Hitachi Rail GTS USA Inc. for design, furnishment, system implementation, support**
7 **and related services for a Communications-Based Train Control System, for a contract**
8 **term of nine years of design and procurement with an amount not to exceed**
9 **\$212,093,633; followed by 10 years of support with an amount not to exceed**
10 **\$114,070,833 and two five-year options to extend the support with an amount not to**
11 **exceed \$237,681,185 for a total contract term of up to 29 years, effective upon approval**
12 **of this Resolution and execution of the agreement; and authorizing SFMTA to approve**
13 **any additions, amendments or other modifications to the contract up to the amount of**
14 **\$2,000,000 per modification that are necessary or advisable to effectuate the purposes**
15 **of the Resolution.**

16 WHEREAS, The San Francisco Municipal Transportation Agency (SFMTA) operates
17 the Muni Metro light rail system, which includes both shared surface right of way and
18 dedicated subways controlled by an outdated analog loop cable-based Automatic Train
19 Control System (ATCS), which first went into service in 1998, and has reached the end of its
20 useful life; and

21 WHEREAS, In February 2020, the Muni Reliability Working Group recommendations
22 included improving the long-term performance of the Muni rail system by replacing the train
23 control system; and

1 WHEREAS, On December 6, 2022, the San Francisco Board of Supervisors passed
2 Ordinance No. 252-22 waiving the Administrative Code prohibition against issuing solicitations
3 for a contract exceeding ten years and authorizing the use of negotiated procurement
4 procedures for a CBTC contract; and

5 WHEREAS, In March 2023, the SFMTA issued a Request for Proposals for a supplier
6 of a Communications-Based Train Control (CBTC) system to replace the ATCS and extend
7 train control territory to surface portions of Muni's rail network, to leverage significant
8 technological advances in train control that will enable the SFMTA to operate its rail service
9 with greater reliability, reduced delays, and increased passenger capacity; and

10 WHEREAS, In March 2024, the SFMTA issued a Request for Best and Final Offers for
11 a supplier of a CBTC system as part of the approved negotiated procurement process; and

12 WHEREAS, The requested supplier contract with Hitachi Rail GTS USA Inc. will
13 provide the SFMTA with the design, furnishment, system implementation, warranty, support
14 and related services for a CBTC system; and

15 WHEREAS, The Civil Service Commission approved Personnel Services Contract
16 request No. 44370 in connection with this contract on July 15, 2024; and

17 WHEREAS, The proposed Train Control Upgrade Project is subject to the California
18 Environmental Quality Act (CEQA); CEQA provides an exemption from environmental review
19 for mass transit projects that institute or increase passenger or commuter service on rail lines
20 already in use, including the modernization of existing stations, as defined in Title 14 of the
21 California Code of Regulations, Section 15275(a), and the California Public Resources Code,
22 Sections 21080(b)(10) and 21080(b)(11); and

23 WHEREAS, On January 22, 2024, the Planning Department, determined (Case N2022-
24 000870ENV) that the Train Control Upgrade Project is statutorily exempt from environmental
25 review under CEQA Title 14 of the California Code of Regulations, Section 15275(a), and the

1 California Public Resources Code, Sections 21080(b)(10) and 21080(b)(11); and

2 WHEREAS, The Approval Action under San Francisco Administrative Code, Section
3 31.04(h)(2)(A), occurred when the SFMTA Board of Directors approved the Train Control
4 Upgrade Project Consultant Contract in Resolution No. 240806-098 on August 6, 2024; and

5 WHEREAS, A copy of the CEQA determination is on file with the Clerk of the Board of
6 Supervisors in File No. 241043; and

7 WHEREAS, On October 15, 2024, the SFMTA Board of Directors adopted Resolution
8 No. 241015, authorizing the Director of Transportation to execute Contract No. SFMTA-2022-
9 40 FTA with Hitachi Rail GTS USA Inc. for a contract term of nine years of design and
10 procurement with an amount not to exceed \$212,093,633 followed by 10 years of support with
11 an amount not to exceed \$114,070,833 and two five-year options to extend the support with
12 an amount not to exceed \$237,681,185 for a total contract term of up to 29 years; and

13 WHEREAS, In order to provide managerial flexibility during the long-term contract, in
14 the same Resolution, the SFMTA Board of Directors authorized the Director of Transportation
15 to approve contract modifications issued under the contract up to the amount of \$2,000,000
16 per contract modification; and

17 WHEREAS, Under Charter, Section 9.118, the Board of Supervisors must approve this
18 contract since it is an expenditure contract in excess of \$10,000,000 and must approve
19 modifications or amendments of the contract having an impact of more than \$500,000; and

20 WHEREAS, A copy of the said contract is on file with the Clerk of the Board of
21 Supervisors in File No. 241043, which is declared to be a part of this resolution as if set forth
22 fully herein; now therefore, be it

23 RESOLVED, That the Board of Supervisors approves the SFMTA entering into a
24 contract with Hitachi Rail GTS USA Inc. for a Communications-Based Train Control System
25 contract for a term of nine years of design and procurement with an amount not to exceed

1 \$212,093,633 followed by 10 years of support with an amount not to exceed \$114,070,833
2 and two five-year options to extend the support with an amount not to exceed \$237,681,185
3 for a total contract term of up to 29 years; and be it

4 FURTHER RESOLVED, That the Board of Supervisors authorizes the SFMTA to
5 approve any additions, amendments or other modifications to the contract up to the amount of
6 \$2,000,000 per contract modification that the Director of Transportation, in consultation with
7 the City Attorney, determines is in the best interest of the SFMTA, and are necessary or
8 advisable to complete the transactions contemplated and effectuate the purpose and intent of
9 this Resolution, such determination to be conclusively evidenced by the execution and
10 delivery by the Director of Transportation of any such documents; and be it

11 FURTHER RESOLVED, That within 30 days of the contract being fully executed by all
12 parties, the SFMTA shall provide the final contract to the Clerk of the Board of inclusion into
13 the official file.

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Item 3 File 24-1043	Department: Municipal Transportation Agency (MTA)
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EXECUTIVE SUMMARY

Legislative Objectives

- The proposed resolution would approve a contract between the San Francisco Municipal Transportation Agency (MTA) and Hitachi Rail GTS USA Inc. (Hitachi) to design and support operations of a new Communications-Based Train Control System for a total contract term of up to 29 years, including a nine-year term and not to exceed amount of \$212,093,633 for design, followed by a ten-year term and not to exceed amount of \$114,070,833 to support operations after installation, and two five-year options and not to exceed amount of \$237,681,185 to extend support.

Key Points

- The Train Control Upgrade Project will replace the Muni’s Automatic Train Control System in the subways with a Communications-Based Train Control (CBTC) System and expand train control to the surface portions of the light rail system over nine years. In December 2022, the Board of Supervisors authorized the MTA to issue a Request for Proposals for a CBTC System for an anticipated contract term exceeding ten years and authorized MTA to use a negotiated procurement process. The MTA selected Hitachi to design, procure, and maintain the CBTC System through a competitive process.
- The proposed resolution allows the Director of Transportation to approve additions and amendments up to the amount of \$2,000,000 per modification. This would provide SFMTA unlimited ability to amend this contract without further Board of Supervisors’ approval.

Fiscal Impact

- The \$212.1 million budget for design includes \$158.5 million for the existing project scope and \$53.6 million for six defined options to enhance the project scope.
- The not to exceed amount of \$114.1 million for the initial 10-year support term and \$237.7 million for the extended term assumes the contractor receives the maximum monthly payment, including a performance incentive and six percent annual escalation.

Policy Consideration

- The support services provided under the proposed agreement are projected to cost approximately \$2 million more per year than the costs to maintain the existing train control system, signaling equipment, and onboard equipment.

Recommendations

- Amend the resolution to clarify that the total not to exceed amount of the contract is \$563,845,651 and allow the Director of Transportation to approve amendments up to a total of five percent of the total contract amount, or \$28,192,283, rather than an unlimited number of amendments of up to \$2 million, and approve the resolution as amended.

MANDATE STATEMENT

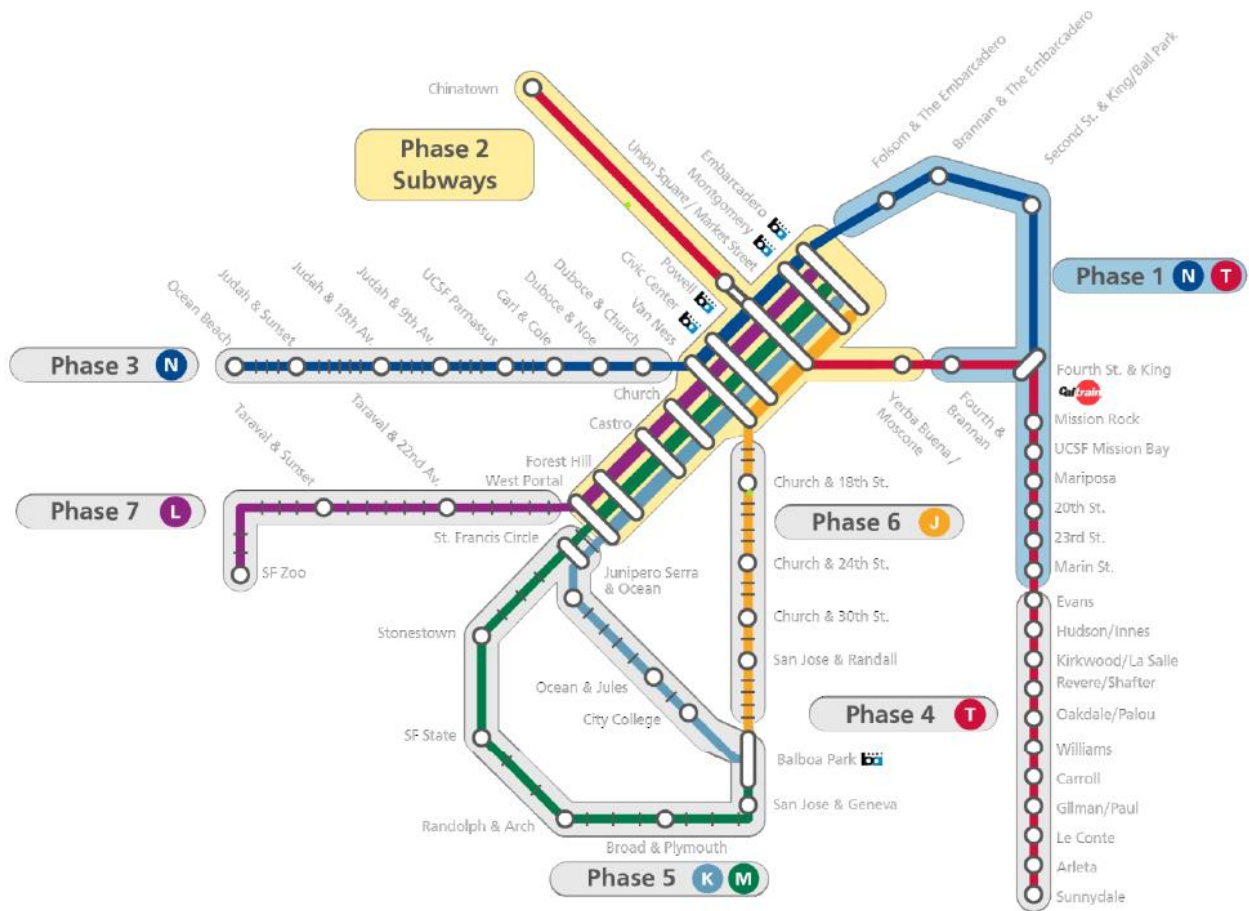
City Charter Section 9.118(b) states that any contract entered into by a department, board or commission that (1) has a term of more than ten years, (2) requires expenditures of \$10 million or more, or (3) requires a modification of more than \$500,000 is subject to Board of Supervisors approval.

BACKGROUND**MTA's Train Control Upgrade Project**

The San Francisco Municipal Transportation Agency (MTA) manages the Muni Metro light rail system, which has relied on an Automatic Train Control System (ATCS) to operate trains underground since 1998. ATCS technology requires manual operations by control center personnel to operate its trains. The Muni's ATCS is now outdated and at the end of its useful life. As a result, the Muni has experienced delays, communications failures, train timeouts, and component failures. The MTA plans to replace the ATCS with a communications-based train control (CBTC) system and expand train control to the surface portions of the light rail system under the Train Control Upgrade Project. Modern CBTC technology uses Wi-Fi or cellular connections, for which the infrastructure must be installed along the entire Muni trackway, both underground and along surface streets.

The Train Control Upgrade Project will replace the Muni's ATCS and bring the entire Muni rail network under a single train control and supervision system in seven phases over nine years. Phase 1 will introduce the CBTC system to the northern Third Street and Embarcadero surface street corridors. Phase 2 will replace the ATCS system in the Market Street Subway and Central Subway. Phases 3 through 7 will extend the new control system to the remaining surface street lines, as shown in Exhibit 1 below.

Exhibit 1: Train Control Upgrade Project Phasing



Source: MTA

All phases of the train control upgrade are expected to take a total of eight years, from 2025 to 2032, including design, installation, testing, and acceptance by SFMTA. Exhibit 2 shows the estimated start and end date of each phase.

Exhibit 2: Project Phasing

Phase	Start	End
Phase 1	11/2026	7/2028
Phase 2	9/2027	2/2030
Phase 3	5/2028	8/2030
Phase 4	1/2029	1/2031
Phase 5	9/2029	7/2031
Phase 6	5/2030	12/2031
Phase 7	2/2031	7/2032

Source: SFMTA

Procurement

In 2018, the MTA released a Request for Information to potential vendors to gauge vendor interest and determine the capacities of CBTC systems. MTA received responses from eight vendors, five of which met federal contracting requirements. Two subsequent mergers of the five vendors that met federal contracting requirements reduced the number of potential vendors to three. In July 2022, MTA released a follow-up RFI that included the final requirements of the Request for Proposals (RFP) and viability of the anticipated contract given changes in the industry after the COVID-19 pandemic.

In December 2022, the Board of Supervisors authorized the MTA to issue an RFP for a CBTC System for an anticipated contract term exceeding ten years and authorized MTA to use a negotiated procurement process (File 22-0948). This enabled the MTA to issue an RFP for both design and long-term support of the CBTC system. Because CBTC systems are proprietary, only the system vendor can provide system support. Once the system is installed, the vendor has an advantage in negotiating sole-source support contracts. MTA pursued the proposed contract model to negotiate the support contract terms before the system was installed.

In March 2023, the MTA released a two-stage RFP for the CBTC Supplier contract. An evaluation panel¹ determined that both proposers qualified for the second stage, the Request for Best and

¹ The evaluation panel for both stages of the RFP included a Technical Evaluation Committee and a Quantitative Evaluation Committee. The Technical Evaluation Committee consisted of the MTA Transit Division Chief Project Manager, the MTA Transit Division Principal Infrastructure Development Manager, the MTA Technology Solutions & Integration Manager, and the MTA Transit Division TMC Operations Manager. The Quantitative Evaluation Committee consisted of the Train Control Upgrade Project Contracts Analyst, the Transit Operations Managements

Final Offers (BAFO). In March 2024, the MTA released the Request for BAFOs with clarifications and refinements to the project scope based on the first stage responses. Based on the scores determined by the same evaluation panel, Hitachi Rail GTS USA (Hitachi) was determined to be the highest-ranking proposer and was selected for contract award. Hitachi is the supplier of the existing ATCS system. Exhibit 3 shows the scoring from the two-stage RFP.

Exhibit 3: RFP Scores

Proposer	Round 1 Score (Out of 100)	Round 2 Score (Out of 100)
Hitachi Rail GTS USA	76.09	73.09
Siemens	55.13	58.36

Source: MTA

Supplier, Installer, and Consulting Contracts

The Hitachi Supplier contract includes design, procurement, and maintenance of the CBTC system. The MTA will contract separately for the installation of train control equipment. In addition, the MTA is contracting with WSP/PGH Wong Joint Venture to provide as-needed consulting services to support the Train Control Upgrade Project. In September 2024, the Board of Supervisors approved the contract with WSP/PGH Wong (File 24-0814).

DETAILS OF PROPOSED LEGISLATION

The proposed resolution would approve a contract between the MTA and Hitachi Rail GTS USA Inc. to design, implement, and support operations of a new Communications-Based Train Control System for a total contract term of up to 29 years, including a nine-year term and not to exceed amount of \$212,093,633 for design, followed by a ten-year term and not to exceed amount of \$114,070,833 to support operations after installation, and two five-year options and not to exceed amount of \$237,681,185 to extend support.

We recommend the Board of Supervisors amend the proposed resolution to clarify the total not to exceed amount of the contract, which, as proposed, does not have a cap. The contract on file totals \$563,845,651.

Delegated Authority

The proposed resolution allows the Director of Transportation to approve additions and amendments to the contract necessary to deliver the project up to the amount of \$2,000,000 per contract modification. This would provide SFMTA unlimited ability to amend this contract without further Board of Supervisors’ approval. As discussed below, 25 percent of the design budget (\$53.6 million out of the total initial cost of \$212.1 million) is for optional service add-ons

Assistant, and the MTA Technology Solutions & Integration Principal Administrative Analyst. In Round 1, the Manager of Engineering Liaison from the BART CBTC Project was also a member of the Technical Evaluation Committee, but this individual did not participate in the second stage of the evaluation due an injury.

that MTA is still evaluating and may not be included in the project scope. If the MTA elects not to proceed with these options, the budgeted amounts will effectively provide additional contingency for the existing project scope. In addition, the contract's not-to-exceed amount already assumes six percent annual inflation adjustments for most line items, which exceeds historical inflation by three to four percent (outside the COVID-induced changes to prices in 2021 and 2022).

We recommend that the Board of Supervisors amend the proposed resolution to allow the Director of Transportation to approve additions and amendments to the contract necessary to deliver the project up to a total amount equal to five percent of the total contract amount, or \$28,192,283. This will provide flexibility to the MTA to approve scope changes while also requiring Board of Supervisors' approval if the total contract amount increases by more than five percent, which may indicate that the project has changed significantly or requires Board of Supervisors' intervention. If the Board of Supervisors wishes to allow the Director of Transportation to approve amendments up to five percent of the total contract amount, MTA could increase the contract amount up to \$592,037,934 without Board of Supervisors' approval.

Scope of Work and Design Options

The first part of the contract includes design of the CBTC system, procurement of software and equipment, and system testing. The CBTC system will be installed in phases across the Muni Metro light rail system as shown in Exhibit 1 above. The contractor will test the CBTC system at the end of each phase to ensure it meets performance standards. The second part of the contract includes system support following installation. System support responsibilities of the contractor include: supplying spare and replacement parts, software updates, diagnostics and troubleshooting, and other technical services to aid the MTA in maintaining the CBTC system.

The MTA may exercise six defined options to enhance the scope of work under the proposed agreement for design and procurement, including the provision of additional vehicle equipment (Options 1, 2, and 3), the purchase of additional interlocking equipment (Option 4) and additional central emergency stop buttons for backup control (Option 5), and additional design services for heritage streetcar or maintenance vehicles (Option 6). MTA structured these as options to lock-in pricing while giving the MTA more time to evaluate the technical approach before committing to including them in the project scope according to MTA staff. As mentioned above, there are also two five-year options to extend the term of the support portion of the contract, referred to as Options 7 and 8.

Subcontractors

The agreement approves the following list of subcontractors:

- Syntony SAS to provide software services
- Anta Electric to provide power systems and equipment
- SacTown Logistics, LLC to provide warehousing and storage services
- Clark Transportation Consulting & Services, LLC dba Bison Rail Systems to provide electrical design services and equipment

- Accio Ads LLC dba Veterans Logistics Group to provide warehousing, storage and delivery services

Milestone Deadlines and Payments

The proposed agreement provides a series of milestones deadlines for the contractor to complete the work for each phase of the design portion of the contract and corresponding milestone payments payable to the contractor upon completion of the milestone. Exhibit 4 below summarizes the milestone payments and deadlines for each phase based on the number of years from the notice to proceed (NTP). The ten phases below include the seven phases shown in Exhibit 1 above plus the system design phase and two phases to deliver central equipment and equipment for vehicles.

Exhibit 4: Milestone Deadline and Payment Summary by Phase

Phase	Description	First Milestone (in Years from NTP)	Last Milestone (in Years from NTP)	Estimated Milestone Payment
1	CBTC System design and engineering services	0.0 (15 days)	2.5	\$43,233,884
2	Central equipment, simulators, tools, and initial training	2.5	9.0	18,025,207
3	On-board computers and equipment for LRVs	2.2	5.1	18,127,571
4	Pilot (N & T)	1.8	6.6	23,447,108
5	Subway Replacement*	2.6	6.6	18,341,550
6	N Expansion*	3.3	7.1	8,410,078
7	T Expansion*	4.0	7.5	8,304,862
8	K & M Expansions*	4.7	8.0	9,830,764
9	J Expansion*	5.4	8.4	4,963,924
10	L Expansion*	6.1	9.0	5,774,563

Source: Proposed Agreement

Notes: NTP refers to Notice to Proceed. Estimated milestone payments for phases five through ten include the maximum annual escalation of six percent. Milestone payments include contract labor and parts.

Retained Funds

For phases 4 through 10 shown above, five percent of the milestone payment is retained by MTA. Half of the retained funds are released when the MTA conditionally accepts the Subway Replacement phase (Phase 5) and the agreement is free from offsets for liquidated damages, claims, and defective work. The remaining half of retained funds is released when the MTA has finally accepted the CBTC system and the contract is free from offsets.

Project Delays

The agreement provides for the contractor to pay damages to the City if the project is delayed beyond the deadlines in the contract schedule except in the event of an “unavoidable delay” beyond the control of the contractor, such as changes in the work ordered by the City, delays caused by the City or the Installers, and force majeure events. In addition, the agreement provides for the contractor to pay damages to the City for requesting closures to trackways and rail lines on short notice (less than 180 days), exceeding the closure period in the closure permit, and for cancelling or postponing a closure.

Performance

The proposed agreement includes performance targets for the CBTC system (such as system availability and maximum hours spent on corrective maintenance) and service levels for technical support services, including response and resolution timelines for issues reported by the MTA.

Once the system is installed, the monthly support service fees are adjusted based on the system’s actual performance compared to the performance targets. The contractor will receive between 80 percent and 108 percent of the monthly support fee based on performance according to calculations provided in Appendix B. Performance targets that impact contractor support fees are shown in Exhibit 5 below.

Exhibit 5: Performance Targets Impacting Support Service Fees

Performance Measure	Target
Availability	99.96%
Reduction in Operating Margin Events*	88
Loss of Critical Function	1
Unsatisfactory Issues Tally	0

Source: Proposed Agreement

*According to MTA staff, Operating Margin Events are failures that require MTA resources to resolve but do not impact service

FISCAL IMPACT

The proposed agreement has a total not to exceed amount of \$563,845,651, including \$212,093,633 for design, \$114,070,833 to support operations for ten years after installation, and \$237,681,185 to support operations for an additional ten years if the options to extend are exercised.

Design and Procurement Costs

Exhibit 6 below shows the design and procurement budget totaling \$212.1 million. The budget includes \$158.5 million (75 percent) for the existing project scope and \$53.6 million (25 percent) for six defined options to enhance the project scope. If the MTA elects not to proceed with these options, the budgeted amounts will effectively provide additional contingency for the existing project scope.

Exhibit 6: Train Control Supplier Contract (Design and Procurement Only)

Train Control Supplier Contract (Procurement)	Cost
CBTC System design and engineering services	\$43,233,884
Central equipment, simulators, tools, and initial training	18,025,207
On-board computers and equipment for LRVs	18,127,571
Wayside equipment and testing services for Initial Technology Demonstration	23,447,108
Wayside equipment and testing services for Subway Replacement Phase*	18,341,550
Wayside equipment and testing services for subsequent surface phases*	37,284,190
Subtotal Train Control Supplier Contract (Procurement)	\$158,459,510
Option 1: Additional LRV onboard equipment (up to 30 vehicles)*	5,516,283
Option 2: Heritage Streetcar onboard equipment (up to 50 vehicles)*	13,923,770
Option 3: Maintenance vehicle onboard equipment (up to 30 vehicles)*	10,803,013
Option 4: Equipment and design services for motorizing up to 10 additional surface rail junctions*	10,226,551
Option 5: Backup control center equipment	656,305
Option 6: Additional design services to support Heritage Streetcar and/or Maintenance Vehicles	12,508,200
Subtotal, Options 1-6	\$53,634,122
Not to Exceed Amount	\$212,093,633

Source: MTA

*Estimated costs include the maximum annual escalation of six percent. All other costs are unescalated.

Support Costs

The contract establishes an original monthly support fee of \$373,511 for the initial term, \$446,139 for the first five-year extension, and \$518,344 for the second five-year extension. The original monthly support fee is subject to an “economic price adjustment” based on labor and materials indices published by the U.S. Department of Labor, Bureau of Labor Statistics to account for cost escalation up to a maximum of six percent per year. The support fee is also adjusted based on contractor performance. The contractor will receive between 80 percent and 108 percent of the original monthly support fee (adjusted for escalation) based on performance. The not to exceed amount of \$114.1 million for the initial 10-year support term and \$237.7 million for an additional 10-years of support if both options are exercised assumes the contractor receives the maximum monthly payment over the entire term, including the performance incentive and six percent annual escalation.

The contractor will provide phased-in support during the initial nine-year term (design phase) as the system is installed. The not to exceed amount of \$114.1 million in the proposed resolution

for the initial ten-years of support following system installation includes approximately \$12.4 million for phased in support provided during the design phase, as shown in Exhibit 7 below.²

² Section 4.5(c) of the proposed agreements states that the not to exceed amount of the procurement term is \$224,469,989. This includes the \$212,093,633 of the procurement phase plus phased-in support of \$12,376,356.

Exhibit 7: Support Costs by Contract Year

Contract Year	Unadjusted Cost (\$2024)	Performance Incentive (8%)	Escalation (6% annual)	Maximum Cost
8	2,465,175	197,214	1,114,261	3,776,650
9	2,801,335	224,107	1,523,704	4,549,146
10	2,353,122	188,250	1,509,189	4,050,560
Subtotal, Phase-in	\$7,619,632	\$609,571	\$4,147,153	\$12,376,356
10	4,482,137	358,571	2,874,645	7,715,352
11	4,482,137	358,571	3,337,566	8,178,273
12	4,482,137	358,571	3,828,262	8,668,970
13	4,482,137	358,571	4,348,401	9,189,108
14	4,482,137	358,571	4,899,747	9,740,455
15	4,482,137	358,571	5,484,174	10,324,882
16	4,482,137	358,571	6,103,667	10,944,375
17	4,482,137	358,571	6,760,330	11,601,037
18	4,482,137	358,571	7,456,392	12,297,099
19	4,482,137	358,571	8,194,218	13,034,925
Subtotal, Support Term	44,821,366	3,585,709	53,287,402	101,694,477
Subtotal, Phase-in & Initial Support Term Not to Exceed	\$52,440,998	\$4,195,280	\$57,434,555	\$114,070,833
20	5,353,671	428,294	10,721,724	16,503,689
21	5,353,671	428,294	11,711,945	17,493,910
22	5,353,671	428,294	12,761,580	18,543,544
23	5,353,671	428,294	13,874,192	19,656,157
24	5,353,671	428,294	15,053,562	20,835,527
Subtotal 1st Extension	26,768,356	2,141,468	64,123,002	93,032,826
25	6,220,133	497,611	18,942,355	25,660,098
26	6,220,133	497,611	20,481,961	27,199,704
27	6,220,133	497,611	22,113,943	28,831,686
28	6,220,133	497,611	23,843,844	30,561,587
29	6,220,133	497,611	25,677,539	32,395,283
Subtotal, 2nd Extension	31,100,664	2,488,053	111,059,642	144,648,359
Subtotal, Extension Options Not to Exceed	\$57,869,020	\$4,629,522	\$175,182,644	\$237,681,185
Total	\$110,310,017	\$8,824,801	\$232,617,199	\$351,752,018

Source: MTA

Development of Contract Budget and Independent Cost Estimate

According to MTA staff, MTA negotiated the contract amounts for design and support based on the bid provided by Hitachi in response to MTA’s Request for Best and Final Offers. Hitachi’s bid was lower than the other respondent’s.

The contract amounts for design and support are within the ranges for bids calculated in the independent cost estimate prepared by WSP USA in March 2023 for MTA based on a price analysis of other CBTC projects.

Funding Sources

Anticipated capital funding sources for the design portion of the contract totaling \$212.1 million include:

- \$136.4 million in federal FTA 5337 State of Good Repair funds;
- \$15.2 million in Caltrans SB1 State of Good Repair funds;
- \$53.0 million in State Transit and Intercity Rail Program (TIRCP) funds; and
- \$7.5 million in required baseline contributions from the City’s General Fund to MTA

Support services will be funded by the MTA operating budget starting in FY 2031-32.

Total Capital Project Costs

Capital costs for the Train Control Upgrade project total \$700 million, including approximately \$212 million for procurement of the train control system under the Hitachi train control supplier contract, as shown in Exhibit 8 below.

Exhibit 8: Train Control Upgrade Project Capital Costs

	Amount (\$millions)
Train control supplier contract (Procurement only)	\$212 million
Network infrastructure and systems integration	64 million
Installation contracts	99 million
Project management and engineering	102 million
Consultant contract	30 million
Testing, training and operational Support	53 million
Contingency (25%)	140 million
Total Project Budget	\$700 million

Source: MTA

Although funding for the proposed agreement has been identified, the project has a \$57 million funding gap according to the MTA letter to the Board of Supervisors on the proposed agreement. The MTA intends to identify the remaining funding for the project through grants and future bond measures.

POLICY CONSIDERATION**Comparison to Existing Support Costs**

According to an October 2024 memo prepared by MTA staff, the support services provided under the proposed agreement are projected to cost approximately \$2 million more per year than the costs to maintain the existing train control system, signaling equipment, and onboard equipment. MTA would receive the following benefits in exchange for the increase in support costs: annual software updates, on-site support technicians compared to remote support under current support agreements, contractor shares in risk of failure with flat rates provided for spare parts, and established performance levels enforced by adjustments to monthly payments. The memo also states that costs to maintain the existing system are likely underestimated, which overstates the cost increase to support the new system.

RECOMMENDATIONS

1. Amend the proposed resolution to clarify that the total not to exceed amount of the contract is \$563,845,651.
2. Amend the proposed resolution to allow the Director of Transportation to approve additions and amendments to the contract necessary to deliver the project up to a total amount equal to five percent of the total contract amount, or \$28,192,283, rather than an unlimited number of contract amendments of up to \$2 million.
3. Approve the proposed resolution as amended.

**City and County of San Francisco
Municipal Transportation Agency
One South Van Ness Ave., 7th Floor
San Francisco, California 94103**

**Agreement between the City and County of San Francisco
and
Hitachi Rail GTS USA Inc.
for the Design, Procurement, System Implementation,
Support and Related Services for a Communications Based
Train Control System**

Contract No. SFMTA-2022-40-FTA

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**City and County of San Francisco
Municipal Transportation Agency
One South Van Ness Ave., 7th Floor
San Francisco, California 94103**

**Agreement between the City and County of San Francisco and
Hitachi Rail GTS USA Inc.
for the Design, Procurement, System Implementation, Support and Related Services for a
Communications Based Train Control System**

Contract No. SFMTA-2022-40 -FTA

This Agreement for the Design, Procurement, System Implementation, Support, and Related Services for a Communications Based Train Control System (“Agreement” or “Contract”) is dated for convenience as _____, negotiated and to be performed in San Francisco, California, by and between Hitachi Rail GTS USA Inc located at 99 Park Ave., Suite 1120, New York, NY 10016, (Contractor), and the City and County of San Francisco (“City”), a municipal corporation, acting by and through its Municipal Transportation Agency (“SFMTA”).

RECITALS

- A.** The SFMTA wishes to procure a Communications Based Train Control System (“CBTC”) that will replace and expand the SFMTA’s current train control system, including the Software development, engineering, technical and other services, Equipment and parts, and design, Systems operations, installation oversight, maintenance and related professional and general services necessary to design, procure, provide, implement, test, certify, support and maintain a CBTC.
- B.** Time is of the essence in the performance of this Agreement, as the SFMTA current train control system has reached the end of its useful life.
- C.** The Contractor will not perform any work that constitutes a public work. Contractor will not perform installation work on transit and other City vehicles, except as authorized by the SFMTA. The SFMTA will separately contract with third-party Installers to perform Equipment installation on SFMTA’s light rail vehicles (LRVs) and wayside and control room Equipment installation.
- D.** This Agreement was competitively procured as required by San Francisco Administrative Code Chapter 21 through a Request for Proposals (RFP) issued on March 3, 2023, pursuant to which City selected Contractor as having submitted the Proposal that will provide the best value to the SFMTA.

- E. The Small Business Enterprise (SBE) subcontracting participation requirement for this Agreement is five percent (5%).
- F. Contractor represents and warrants that it is qualified to perform the Services required by City as set forth in this Agreement.
- G. The City’s Civil Service Commission previously approved Contract numbers 42673 – 21/22 for the System Procurement portion of this Agreement on June 6, /2022, and 41562 – 21/22 for the Support portion of this Agreement on February 7, 2022. Subsequently, the Commission approved the combined Contract number 44370 – 23/24 for this Agreement on July 15, 2024.
- H. The Municipal Transportation Agency Board of Directors approved this Agreement by Resolution No. [insert resolution number] on [insert date of Commission or Board action].
- I. The San Francisco Board of Supervisors approved this Agreement by Resolution No. [insert resolution number] on [insert date Board action].
- J. Now, therefore, in light of the statements in these Recitals, the Parties agree as follows:

GENERAL PROVISIONS

ARTICLE 1 CONTRACT DOCUMENTS

This Agreement is comprised of the following documents (“the Contract Documents”), which together state all obligations, duties, and requirements of the Parties, and the benefits each Party will obtain from performance of this Contract, and constitute the Contract:

- 1.1. This “General Provisions,” document, which establishes the contractual relationship of the Parties and the general terms and conditions of the Agreement.
- 1.2. The Included Appendices to this Agreement listed in Article 14 of this Agreement.
- 1.3. Approved Contract Modifications, and approved Change Orders.

ARTICLE 2 DEFINITIONS

The following definitions apply to this Agreement. Where any word or phrase defined below, or a pronoun in place of the word or phrase, is used in any part of this Agreement, it shall have the meaning set forth below. Appendix A (Contract Specifications) and Appendix K (CBTC Software License Agreement) contain additional defined terms, which are incorporated here by reference.

- 2.1. **“Acceptance”** or **“Accept”** means the formal written statement to Contractor from the SFMTA acknowledging that all Work that Contractor must provide, (or a specific portion thereof) have been satisfactorily completed in accordance with Contract requirements. See Contract Specifications, Section 8 (Deployment, Migration and Acceptance); see also definition of “Conditional Acceptance,” below.
- 2.2. **“Additional Work”** means work or services authorized by SFMTA in a Change Order or Contract Modification that is not Work described in the Contract as of the Effective Date and is not Incidental Work.

2.3. “**Affiliate**” means a legal entity that is directly or indirectly controlled by, or controls the Contractor or is under common control with the Contractor.

2.4. “**Agreement**” or “**Contract**” means the documents listed in Article 1 (Contract Documents) of the Contract Agreement memorializing the parties’ agreement, the bonds or other security, approved Contract Modifications and approved Change Orders, and all applicable City Ordinances and Mandatory City Requirements and other documents that are expressly incorporated into this Agreement. Reference Materials are not Contract Documents.

2.5. “**Automatic Train Control System**” or “**ATCS**” means the Thales Seltrac system currently installed and in use in the Market Street Subway and Central Subway.

2.6. “**Award**” means approval of the award of the Contract to Contractor by the SFMTA Board of Directors, the San Francisco Board of Supervisors, and the Mayor, subject to Contractor’s providing documents evidencing bonds and insurance coverage as required by this Agreement, and to such other conditions as may be specified in the Request for Proposals, or otherwise required by the City or by law.

2.7. “**CCO**” means the SFMTA’s Contract Compliance Office.

2.8. “**Change**” means a modification, addition, deletion or other alteration of the Contract Requirements or provisions of the Agreement, or of a Deliverable, as described in a Contract Modification or Change Order, that has already been approved by the SFMTA. See Section 12.5 (Contract Modifications and Change Orders), Appendix A, Contract Specifications, Section 15 (Change Control Procedures), and Appendix E (Contract Changes).

2.9. “**Change Order**” means a written directive from the SFMTA to the Contractor to effect a change. See Section 12.5.

2.10. “**City**” means the City and County of San Francisco, a municipal corporation, acting by and through its Municipal Transportation Agency.

2.11. “**City Data**” or “**Data**” means the data described in Article 13 of this Agreement, which includes, without limitation, all data collected, used, maintained, processed, stored, or generated by or on behalf of the City in connection with this Agreement, as well as City Confidential Information, SSI, infrastructure information, and data provided by a third-party to the City for use under this Agreement.

2.12. “**Clarification**” means a written communication from the SFMTA responding to a Request for Information explaining a Contract requirement that provides Contractor additional information or context concerning a Contract requirement, but does not modify the Contract requirement at issue. (See Appendix E (Contract Changes).)

2.13. “**Closures**” means the planned suspension or unplanned interruption of Revenue Service during the usual operating hours and dates listed in SFMTA’s Track and Tunnel Access Procedures in Appendix J (SFMTA Policies and Procedures).

2.14. “**Commissioning**” means the Contractor’s certification that a Phase of the CBTC System has passed all required safety tests and may be placed in Revenue Service.

2.15. “**Communications Based Train Control System**” or “**CBTC System**” or “**CBTC**” generally means a railway signaling system that makes use of telecommunications

between the train and track equipment for traffic management and infrastructure control, and specifically refers to the System to be procured under this Agreement.

2.16. “Conditional Acceptance” means the formal written acknowledgement by the SFMTA Director of Transportation or his or her designee that a portion of the Project or Services meets the criteria stated or described in the relevant provisions for that portion of the Project or Services to be accepted. See Section 8 (Deployment, Migration and Acceptance) of the Contract Specifications.

2.17. “Confidential Information” means information, documents, schematics, plans and data that the SFMTA has identified as confidential or otherwise withheld from public access without the express written authority of the SFMTA, which includes, but is not limited to Security Sensitive Information (SSI) and Critical Infrastructure Information (CII), and proprietary information from third parties that is licensed to the SFMTA. See Section 13.1 (Nondisclosure of Private, Proprietary, or Confidential Information).

2.18. “Configure” or “Configuration” means the use of native tools in the System to change its behavior or features without modifying the System’s Software or Hardware; System performance requirements that can be met through Configuration do not require Customization.

2.19. “Contract Amount” is the value stated in Section 4.5.1 (Calculation of Charges), as that amount may be amended by properly approved Contract Modifications.

2.20. “Contract Documents” means the documents listed in Article 1 (Contract Documents) of the Agreement, which memorialize the Parties’ agreement concerning the matters described therein.

2.21. “Contract Modification” means a written amendment to the Contract, executed by the City and Contractor in accordance with the City’s Charter and Municipal Codes, effecting changes in the Contract concerning the Term of the Agreement, Contract Amount, or the scope or details of the Work.

2.22. “Contract Rates” means the original prices and rates stated in the Contract at the time the Contract was awarded. See Appendix B (Schedule of Prices and Calculation of Charges).

2.23. “Contract Schedule” means the schedule Contractor submitted with its Proposal, as amended by Contract Modification, which shall be the basis for the Project Schedule. See Appendix D (Contract Schedule).

2.24. “Contract Specifications” means the CBTC System functional, performance, and technical requirements stated in Appendix A (Contract Specifications) of the Agreement.

2.25. “Contract Term” means the period stated in the Contract during which Contractor shall complete the Project, commencing on the date stated in the Notice to Proceed and ending at the conclusion of the Support Term. (See Article 3 (Contract Term).)

2.26. “Contract Time” means times stated in the Contract during which Contractor shall complete Milestones, Phases, and the entire Project, as applicable.

2.27. “Contractor” means Hitachi Rail GTS USA Inc., and as applicable its agents, subcontractors, Affiliates, and suppliers that will perform Work under this Agreement.

2.28. “Controller” means the Controller of the City.

2.29. “Critical Infrastructure Information” means documents, data files, computer files, designs, and other Materials that contain information that may not qualify as Security Sensitive Information, but that the City directs are not to be released to the public or otherwise disclosed as doing so would pose a risk to the security of the City’s public transit system, public infrastructure, or to public safety.

2.30. “Customization” means a feature, extension, or modification that requires custom coding and/or some form of special implementation to add function(s) or features to the Software, as more specifically described in the Contract Specifications.

2.31. “Day” (whether or not capitalized) means a calendar day commencing at 12:00 AM and expiring on 11:59 PM, unless otherwise expressly stated. Unless expressly stated otherwise, “Days” shall mean consecutive calendar days.

2.32. “Defect” means a deviation from specified performance requirements of any element(s) of the System, including Software, including but not limited to, a deviation caused by design error, Software Error, omission, or manufacturing error.

2.33. “Delay” is defined in Section 5.18 (Delay, Force Majeure, and Liquidated Damages).

2.34. “Deliverables” means Contractor’s work product that are Services provided by Contractor to City under this Agreement, which include without limitation, the work product described in the Contract Specifications and the Submittals listed in Section 35 (Contract Data Requirements List (CDRL)) of the Contract Specifications.

2.35. “Deployment Phase” means a phase of the Project that results in deploying the fully functional CBTC System over a specifically defined geographic portion of the SFMTA light rail network.

2.36. “Director” means the Director of Transportation of the SFMTA or his or her designee.

2.37. “Disadvantaged Business Enterprise” or “DBE” means a for-profit, small business concern owned and controlled by a socially and economically disadvantaged person(s) as defined in 49 Code of Federal Regulations, Section 26.5.

2.38. “Effective Date” means the date the SFMTA notifies Contractor through a Purchase Order and Notice to Proceed that the City’s Controller has certified the availability of funds for this Contract as provided in Section 3.1 of Article 3 (Contract Term), and that the Contract has been fully approved and executed by the City.

2.39. “Enhancement” means a modification to the Software to add new features or functions to the Software that is not a general Update or Upgrade to the Contractor’s Base System and is requested by the SFMTA under a Contract Modification.

2.40. “Equipment” means the hardware, computers, servers, diagnostic and simulation tools, spare parts, special tools, and all other electronic, mechanical or electrical components to be provided by Contractor that is part of or is necessary to implement the CBTC System under this Agreement.

2.41. “Fix” means repair or replacement of source, object or executable code in the Software to remedy an Error, Defect or Malfunction.

2.42. “Event of Default” is an action or failure to act by Contractor that is a material breach of the Agreement. See Section 9.2.1 (Event of Default).

2.43. “Final Acceptance” means the formal written Acceptance by the SFMTA Director of Transportation or his or her designee that all Contract Deliverables for the Procurement portion of the Contract have been satisfactorily completed and accepted. See Section 8 (Deployment, Migration and Acceptance) of the Contract Specifications.

2.44. “Final Commissioning Date” means the Commissioning date of the Final Deployment Phase.

2.45. “Fiscal Year” means the City and County of San Francisco’s fiscal year, from July 1 to June 30. Fiscal years are expressed as two years, i.e., “FY23-24”.

2.46. “Force Majeure Event” means an act of God; flood; windstorm; tornado; wars; riot; insurrection; epidemic and other public health emergencies; quarantine restrictions; strikes and lockouts; freight embargoes; acts of a governmental agency exercising regulatory or other police powers; priorities or privileges established for the manufacture, assembly, or allotment of Equipment or Materials by order, decree, or otherwise of the United States or by any department, bureau, commission, committee, agent, or administrator of any legally constituted public authority that delay the progress or completion of the Project, Milestone, or other portion of the Project.

2.47. “FTA” means the Federal Transit Administration.

2.48. “Fully Burdened Labor Rate” means an hourly labor rate that includes wages, benefits, taxes and overhead costs, but does not include profit.

2.49. “Hardware” means Equipment.

2.50. “Heritage Vehicles” is as defined in the Contract Specifications Section 2.4.2, paragraph 1.

2.51. “Incidental Work” means work, expenditure, costs and time that Contractor must expend to perform the Work that is not specifically described in the Agreement as Work, but that is integral and necessary to perform the Work, and customary to be performed by the Contractor.

2.52. “Indemnitee” means any party or entity to which Contractor owes a duty of indemnity of claims and lawsuit as provided in this Agreement. See Section 6.2 (Indemnification).

2.53. “Installer” means a third-party contractor(s) that the SFMTA will engage to install System Equipment on the wayside, in control rooms, and on Vehicles.

2.54. “Issue” means a Defect, Malfunction or Software Failure that the SFMTA has reported to the Contractor in accordance with the procedures described in Appendix I.

2.55. “Issue Report Form” means a form used by SFMTA to report Issues to the Contractor. This form may be electronically submitted.

2.56. “Key Personnel” means Contractor’s and Subcontractors’ personnel listed in Section 5.8.2, which have specialized expertise and experience necessary for the design and/or implementation of the CBTC and successful completion of the Project.

2.57. “Legacy System(s)” means the SFMTA data and technology systems listed in the Contract Specifications, Section 28.3 (CBTC External Interfaces).

2.58. “Light Rail Vehicle (LRV)” or “Light Rail Vehicle 4 (LRV4)” means the light rail vehicles the SFMTA has or will procure from Siemens Mobility, Inc.

2.59. “Loss of Critical Function” is as defined in the Contract Specifications, Section 30.2.1 (Failure Allocation and Categorization).

2.60. “Malfunction” means a deviation between the observed function of the System and the approved documentation of the functionality of the System (e.g., manuals, instructions, CDRLs) furnished by Contractor.

2.61. “Mandatory City Requirements” means those City laws set forth in the San Francisco Municipal Code, including the duly authorized rules, regulations, and guidelines implementing those laws, that impose specific duties and obligations upon Contractor.

2.62. “Materials” means items or supplies necessary for the installation or implementation of the System provided by the Contractor that are not Equipment or Shop Materials.

2.63. “Milestone” means a specific portion of the Work to which the Contract states a completion date and ties compensation to the completion of that Work.

2.64. “Milestone Schedule” means the list of completion dates for the project Milestones contained in Appendix C (Milestone Schedule and Payment) of the Agreement.

2.65. “Muni” means the San Francisco Municipal Railway, a division of the SFMTA.

2.66. “Notice to Proceed” means written notice to the Contractor of the date on which it shall begin performance of the Contract.

2.67. “Option” means the power of the City under the Agreement to direct Contractor to perform additional Work that is identified as an Option, for the price and in accordance with the requirements stated in the Agreement.

2.68. “Owner’s Representative” means the SFMTA employee assigned to manage the System for the SFMTA and to direct the Contractor in providing the Support Services. The Project Manager is the Owner’s Representative until Final Acceptance.

2.69. “Patch” means temporary repair or replacement of code in the Software to remedy an Error, Defect or Malfunction.

2.70. “Party” and “Parties” means the City and Contractor either individually or collectively.

2.71. “Performance Requirement” means the requirements defined in the Contract for System Performance, based on the Performance Targets and Performance Metrics. See Contract Specification, Section 30 (Reliability, Availability and Maintainability).

2.72. “Performance Target” means a quantifiable level of performance or condition, expressed as a value of the measure of performance Contractor shall achieve during the RAM Demonstration and that Contractor shall maintain during the Support Term to qualify for full payment of the Performance Fee. (See Contract Specifications, Section 30.3 (Quantitative RAM Objectives), and Appendix B, section B.2.2.)

2.73. “Phase” means a phase of System Procurement.

2.74. “Precedence” means the higher authority of a Contract Document over all other Contract Documents with lower precedence, used in the construction and interpretation of this Agreement. See Section 12.14 (Order of Precedence).

2.75. “Priority Protocol” means the rules, based on the Priority Category, that specify the time for response or resolution for correcting Errors, Malfunctions and Defects, escalation procedures, and personnel assignment, as specified in the Agreement.

2.76. “Procurement Term” means the initial eight-year period of the Contract Term, ending at System Final Acceptance, during which Contractor shall design, procure, oversee installation, test, certify and implement the CBTC System into Revenue Service. See Article 3 (Contract Term) and Appendix A (Contract Specifications).

2.77. “Project” means the entire endeavor of designing, furnishing, integrating, testing, Commissioning, and supporting the CBTC System, as described and specified in the Agreement.

2.78. “Project Schedule” means the SFMTA-approved schedule prepared by Contractor showing the schedule and deadlines by which Contractor will complete the design, implementation, testing and Commissioning of the CBTC and delivery of related Services, or specified elements or portions of the Project. See Contract Specifications, Section 3 (Project Management).

2.79. “Project Manager” or “Engineer” means the SFMTA employee assigned to manage the Project for the SFMTA.

2.80. “Proposal” means the information submitted by Contractor in response to the original RFP 2022-40-FTA as modified by the Best and Final Offer.

2.81. “Proposed Contract Change” (PCC) is a written request from SFMTA to amend the Agreement, as further described in Appendix E (Contract Changes).

2.82. “Proprietary Information” means any confidential or non-public information, which has economic value and is protected with reasonable safeguards to maintain its secrecy owned or disclosed by or on behalf of the Contractor or any of its Affiliates as defined herein. Examples of Proprietary Information include, but are not limited to, trade secrets, technical data, know-how, development plans, business plans and processes, formulas, strategies, improvements, data, network configurations, system architecture, computer programs, designs, drawings, inventions, discoveries, customer lists and financial data belonging to Contractor or Affiliates or customers of Contractor.

2.83. “Purchase Order” means the written order issued by the City to Contractor, authorizing the Effective Date as provided in Section 3.1 (Contract Term).

2.84. “Reduction in Operation Margin” is as defined in the Contract Specifications, Section 30.2.1(Failure Allocation and Categorization).

2.85. “Reference Materials” means those documents, drawings, and other Materials listed in Appendix L (Reference Materials) to this Agreement that the City provides to Contractor for information only; reference Materials are not Contract Documents and are not incorporated into the Agreement. See Section 7.6 (Liability for Reference Materials).

2.86. “Reimbursable Parts” means the parts, special tools or Materials for which the Contractor shall be entitled to reimbursement from the SFMTA due to an out-of-scope replacement. See Contract Specifications, Section 32.4.1 (Provisions of Equipment and Spare Parts), Item 5.

2.87. “Release” means a deployment of the latest release newest version of the Software for use in SFMTA’s CBTC System, which supersedes previous versions of the Software.

2.88. “Reliability, Availability, and Maintainability” (RAM) means metrics used to measure the reliability, availability, and maintainability of the System. See Appendix B, section B.2.2, and Contract Specifications, Section 30.3 (Quantitative RAM Objectives).

2.89. “Request for Contract Change” (RCC) is a written request from Contractor to modify the Agreement, as further described in Appendix E (Contract Changes).

2.90. “Resolution Time” means the time between when an Issue is first described/reported in an Issue Report Form and when it no longer occurs. See Appendix I, Section I2.3.

2.91. “Response” means the engagement of Contractor’s technical support staff to review and resolve the reported Issue and the initial technical communication between Contractor’s technical support staff and SFMTA’s staff concerning the reported Issue. See Appendix I, Section I2.3.2.

2.92. “Revenue Service” means the activities by which the SFMTA provides transit services to the public and the state of a transit Vehicle providing transit service for payment of fares.

2.93. “Root Cause Disposition” means Contractor’s written explanation of the reasons why an Issue occurred, along with Contractor’s recommended plan to resolve the Issue. See Appendix I, Section I2.3.3.

2.94. “San Francisco Municipal Transportation Agency”, “SFMTA” or “Agency” means the City department with jurisdiction over public transit in San Francisco, as provided under Article VIIIA of the City’s Charter.

2.95. “Sensitive Security Information” or “SSI” is as defined under applicable federal law and federal Department of Transportation security policies, 49 Code of Federal Regulations (CFR) Parts 15 and 1520.

2.96. “Service Affecting Failure” is as defined in Contract Specifications, Section 30.2.1(Failure Allocation and Categorization).

2.97. “Services” means “Work”.

2.98. “Severity Level” or “Priority Category” means the category assigned to an Issue designating the urgency (priority) informing Contractor’s allocation of resources to correct the Issue and the time limits for correction. See Appendix I, Section I2.1 (Severity Levels).

2.99. “Shop Materials” means common Materials that are readily obtainable by Installers in the local (San Francisco Bay Area) market, as determined by the SFMTA and described in Contract Specifications, Section 2 (Summary of Work & Scope Split).

2.100. “Small Business Enterprise” or “SBE” means a for-profit, small business concern with a three-year average gross revenue that does not exceed the thresholds set forth by applicable law and either: 1) is certified under any of the following programs: the State of California's Small Business Program with the Department of General Services (State Program), the City and County of San Francisco's LBE Program (City Program), or the California Unified Certification Program (Federal DBE program), or 2) has received written confirmation from CCO that it meets the SFMTA’s program eligibility requirements.

2.101. “Software” means all or any part of the specific collection of computer programs and/or machine-readable instructions used to operate or monitor the CBTC provided by Contractor under this Agreement, whether as a stand-alone product, pre-installed on Equipment, or provided as an application (as software as a service) including any Enhancements, Updates or Upgrades to the original Software licensed to the SFMTA under this Agreement. See Appendix K, (CBTC Software License Agreement). Software includes internet or “cloud” based software, including software applications and Software provided as Software as a Service (“SaaS”).

2.102. “Software Failure” is as defined in the Contract Specifications Section 1.4 (Definitions).

2.103. “Subcontractor” means any entity that has a contract with the Contractor to perform the Services.

2.104. “Supplier” means any firm or individual under contract to Contractor to provide Equipment, Materials or other goods necessary for Project.

2.105. “Support Fee” means the payment the SFMTA makes to Contractor in exchange for monthly Support Services.

2.106. “Support Services” means Software Updates, Spare parts, remote advice and System problem diagnostics, trouble shooting, as-needed on-site support, remote support, training, and ancillary Services, as described more fully in Contract Specifications, Section 32 (Support Services), and such other services required under the Contract that are necessary to assist the SFMTA maintaining the System during the Contract Term.

2.107. “Support Term” means the portion of the Contract Term after completion of the Procurement Term during which Contractor shall provide Support Services for the CBTC System.

2.108. “System” means the Software, firmware, Equipment, components, subcomponents, subsystems, assemblies, processes, data, and other Services that constitute the CBTC.

2.109. “System Performance” means the actual performance of the System as measured using the Performance Metrics calculated using the methodology set out in the Contract Specifications, Section 30 (Reliability, Availability and Maintainability).

2.110. “Unavoidable Delay” is as defined in Section 5.18.2 (Unavoidable Delay).

2.111. “Unsatisfactory Issue Resolution” means an Issue to which the Contractor did not respond, did not provide a root cause disposition or did not resolve within the “Response and Resolution Time” targets identified in Appendix I. See Section I4.

2.112. “Update” means modifications to the Software to correct Errors, Defects and Malfunctions within the existing functions of the Software, to address security vulnerabilities, and to stay current with the version of the operating system (including operating system updates and patches) installed on the Equipment. Updates are within the scope of prepaid Support Services.

2.113. “Upgrade” means modifications to the Software to add new features or functions to the Software that are offered universally to Contractor’s other customers using the same Base Product as SFMTA’s CBTC System, or new versions of the Software developed to facilitate migration of the Equipment to a new operating system. Upgrades are within the scope of prepaid Support Services.

2.114. “Vehicle” means LRVs, Heritage Vehicles, or Maintenance Vehicles that travel on SFMTA trackway and are required to be tracked by the CBTC System.

2.115. “Warranty Period” means the period commencing at Commissioning of each Phase during which the Contractor will provide Warranty Services pursuant to the Contract Documents. See Contract Specifications, Section 13 (Warranty and Spare Parts).

2.116. “Warranty Services” is as defined in Contract Specifications Section 13.2, paragraph 4.

2.117. “Work” means Contractor’s obligation to perform and the work product derived from Contractor’s performance and provision of design, engineering, manufacturing, testing, Commissioning, labor, supervision, products, Materials, machinery, Equipment, tools, supplies, and facilities described in the Contract and Incidental Work necessary for the implementation and support of the CBTC. The terms Work and Services are synonymous.

2.118. “Workaround” means a change in the procedures followed or end user operation of the Software to avoid an Error, Defect or Malfunction without significantly impairing functionality or degrading the use of the Software or the CBTC.

ARTICLE 3 CONTRACT TERM

3.1. The Contract Term shall commence on the Effective Date of this Agreement and expire 19 years later, on [insert expiration date], unless earlier terminated or extended by Contract Modification(s) as provided in this Agreement. The Contract Term comprises a System Procurement Term followed by a Support Term, which together with all exercised Options shall not exceed a total of 29 years.

3.2. The System Procurement Term commences on the Effective Date of this Agreement and shall continue for a period of not more than 9 years, which includes the warranty coverage at the end of each Phase of the System Procurement.

3.3. The Support Term shall commence at end of the first Warranty Period (for the Pilot and Subway Replacement Phases) of the Procurement Term and continue for a period (base term) of 10 years after Final Acceptance. See Section 2.106 (Support Term) of Article 2 (Definitions). The City has two Options to extend the Support Term for five years each, for a total Support Term not to exceed of 20 years (a portion of which overlaps the Warranty Period for the final Phase of the Procurement Term due to the staggered acceptance of Deployment Phases).

3.4. The phases of the Project within the Contract Term are more specifically described in the Contract Specifications, Section 8 (Deployment, Migration and Acceptance).

ARTICLE 4 FINANCIAL MATTERS

4.1. Certification of Funds; Budget and Fiscal Provisions; Termination in the Event of Non-Appropriation. This Agreement is subject to the budget and fiscal provisions of the City's Charter. Charges will accrue only after prior written authorization certified by the Controller in the form of a Purchase Order, and the amount of City's obligation hereunder shall not at any time exceed the amount certified for the purpose and period stated in such advance authorization. This Agreement will terminate without penalty, liability, or expense of any kind to City at the end of any fiscal year if funds are not appropriated for the next succeeding fiscal year. If funds are appropriated for a portion of the fiscal year, this Agreement will terminate, without penalty, liability, or expense of any kind at the end of the term for which funds are appropriated. City has no obligation to make appropriations for this Agreement in lieu of appropriations for new or other agreements. City budget decisions are subject to the discretion of the Mayor and the Board of Supervisors. Contractor's assumption of risk of possible non-appropriation is part of the consideration for this Agreement.

THIS SECTION 4.1 CONTROLS AGAINST ANY AND ALL OTHER PROVISIONS OF THIS AGREEMENT.

4.2. Guaranteed Maximum Costs. The City's payment obligation to Contractor shall not at any time exceed the amount certified by City's Controller for the purpose and period stated in such certification. Absent an authorized public emergency, as provided in the City's Charter and Municipal Codes or other applicable laws, no City representative is authorized to offer or promise, nor is the City required to honor, any offered or promised payments to Contractor under this Agreement in excess of the certified maximum amount without the Controller having first certified the additional promised amount and the Parties having modified this Agreement as provided in Section 12.5 (Contract Modifications and Change Orders).

4.3. Certified Funding. The City may receive and authorize funding for this Project in installments. The SFMTA by formal notice will inform Contractor of the value of certified funds, and Contractor shall by formal notice inform the SFMTA when the value of the Services and goods provided has reached 80 percent of the value of the certified funds.

4.4. Amendments to Contract Amount and Term. Contractor shall not be entitled to an increase in the Contract Amount or an extension of the Contract Term unless the Parties memorialize that amendment in a Contract Modification in accordance with Section 12.5 (Contract Modifications and Change Orders).

4.5. Contractor Compensation

4.5.1. Calculation of Charges. The City shall compensate Contractor for Work for the period invoiced in accordance with this Section 4.5 for Work that the Director of Transportation, or his or her designee, in his or her reasonable discretion, concludes have been satisfactorily performed in accordance with Contract requirements. The breakdown of charges associated with this Agreement appears in Appendix B (Schedule of Prices and Calculation of Charges). As provided in Section 4.5.3 (Retention), the City will withhold a portion of payment as retention until the Final Acceptance of the CBTC. In no event shall City be liable for interest or other charges for any late payments.

(a) Procurement Term. During the System Procurement Term, SFMTA shall pay Contractor for completed Work as provided in the Milestone Schedule stated in Appendix C (Payment Milestones) in accordance with Contract requirements for that Milestone and the payment requirements stated in Appendix B (Schedule of Prices and Calculation of Charges).

(b) Support Term. During the Support Term, Contractor shall provide an invoice to the SFMTA on a monthly basis for Support Services provided (including goods delivered, if any) and the achieved CBTC System RAM performance in the immediately preceding month, according to the schedule set out in Appendix B (Schedule of Prices and Calculation of Charges).

(c) Not to Exceed Amounts. Before the end of the System Procurement Term, the amount paid to Contractor under this Agreement shall not exceed two hundred and twenty-four million, four hundred sixty-nine thousand, nine hundred and eighty-nine Dollars (\$224,469,989). Until 10 years after Final Acceptance, the amount paid to Contractor under this Agreement shall not exceed three hundred and twenty-six million, one hundred sixty-four thousand, four hundred and sixty-five Dollars (\$326,164,465). In no event shall the amount of this Agreement exceed five hundred sixty-three million, eight hundred forty-five thousand, six hundred and fifty-one Dollars (\$563,845,651), which amount includes all Options (as described in Section 5.2 Exercise of Options), economic price adjustments and compensation described in the Agreement. Notwithstanding the foregoing, the amount of this Agreement may be changed by Contract Modifications as described in Section 12.5 (Contract Modifications and Change Orders).

4.5.2. City's Payment Obligations. Subject to the provisions of the Contract Documents, progress payments in accordance with Appendix B2, Section B2.1.1 (Payment Procedures) will be made to Contractor for all Work performed in accordance with the Contract. The City's payments to Contractor shall not constitute a waiver by the City of any rights under the Contract and shall not constitute implied acceptance by the City for Work that does not meet Contract requirements. The City's payments to Contractor shall not excuse Contractor from its obligation to replace or reperform non-conforming Work even if the non-conformance of such Work may not have been apparent or detected at the time such payment was made. The City may reject Work that does not conform to the requirements of this Agreement. In such case, Contractor must replace or reperform non-conforming Work without delay and at no cost to the City.

4.5.3. Retention

(a) The SFMTA will hold five percent (5%) in retention ("Retained Funds") from each Milestone payment it makes to Contractor for Work satisfactorily performed. Retained Funds are held for the benefits and protection of the SFMTA.

(b) The City shall release fifty percent (50%) of Retained Funds upon the following conditions: (a) Conditional Acceptance of the Subway Replacement Phase; and (b) the Contract is free of offsets by the City for liquidated damages, claims, and defective Work, and is free of forfeitures and other charges.

(c) The City shall release all remaining Retained Funds only upon the following conditions: (a) the SFMTA has issued Final Acceptance of the CBTC; and (b) the

Contract is free of offsets by the City for liquidated damages, claims, and defective Work, and is free of forfeitures and other charges.

(d) The Contractor may apply for early release of retention for Work performed by any subcontractor whose portion of the Work is complete and has been conditionally accepted by the SFMTA. Contractor shall make such application in writing and shall certify the following:

4.5.3.d.1 That the Work by the subcontractor is complete and satisfactory in accordance with the Contract Documents;

4.5.3.d.2 The total amount paid to the subcontractor by Contractor as of the date of the written request; and

4.5.3.d.3 The amount of Retained Funds associated with the Work performed by the subcontractor.

(e) Contractor acknowledges and agrees that the release of Retained Funds under this subparagraph shall not reduce the responsibilities or liabilities of the Contractor or its surety(ies) under the Contract or applicable law.

(f) At the request and expense of Contractor, the Retained Funds may be placed in escrow in an interest-bearing account approved by the City's Controller. Upon Contractor's request, the City will authorize the escrow agent to release to Contractor the accrued interest from the Retained Funds, no less often than quarterly.

(g) The City shall have the right to use and apply Retained Funds, in whole or in part, to reimburse the City for all liquidated damages due or to become due to the City, complete Work that Contractor is unwilling or unable to complete, and to satisfy any claim or other obligation of the Contractor under the Contract. Any remaining balance of such retained funds shall be paid to Contractor only after discharge in full of all liability incurred by Contractor. If the Retained Funds are not sufficient to discharge all such liabilities of Contractor, Contractor and its sureties shall remain liable to the City until all such liabilities are satisfied in full. Should the Retained Funds be insufficient to cover such damages, Contractor shall pay forthwith the remainder to the City.

4.5.4. Withhold Payments. If Contractor fails to perform the Work in accordance with Contractor's obligations under this Agreement, the City may withhold payment for any element of the Work in dispute until that element of the Work is properly performed, and Contractor shall not stop, suspend or slow its performance of the Work as a result of City's withholding of payments as provided herein.

4.5.5. Invoice Format. Invoices submitted by Contractor under this Agreement must be in a form acceptable to the City's Controller and the SFMTA. City will make payment as specified in Section 4.5.9 (Contractor Payment), or in such alternate manner as the Parties have agreed upon in writing. All invoices must include the following:

- a. A unique invoice number;
- b. A specific invoice date;
- c. PeopleSoft Contract and Purchase Order ID numbers;
- d. PeopleSoft Supplier Name and ID;
- e. Relevant Milestones

- f. Complete description of Work invoiced
- g. Quantity of items;
- h. Description and quantity of invoiced items;
- i. Unit prices of invoiced items;
- j. Sales/use tax;
- k. Total invoice amount;
- l. Retention calculation;
- m. Monthly progress report as required by Contract Specifications, Section 3.6.1 (Monthly Progress Report).
- n. Monthly performance report compared to performance standards stated in Contract Specifications, Section 30.3 (Quantitative RAM Objectives) (when applicable)
- o. Supporting documentation to demonstrate achievement of Relevant Milestone

Invoices that do not include all required information or contain inaccurate information will not be processed for payment.

4.5.6. Payment Terms

(a) Unless the SFMTA notifies Contractor that a dispute exists, the City will make a good faith effort to issue payment within 30 Days from the date of receipt of the invoice. Payment is deemed to be made on the date on which City has posted the electronic payment to Contractor. In the event that City does not make payment within a reasonable amount of time after such thirty (30) day period or is unable to make payments after such thirty (30) day period, then Contractor will have the right to suspend the Work until such payment arrangements are mutually agreed upon by the Parties.

(b) No additional charge or interest shall accrue against City in the event City does not make payment within any time specified by the Contract.

4.5.7. Progress Payment Form. The SFMTA will not authorize payment of an invoice submitted by Contractor prior to Contractor’s submission of the SFMTA Progress Payment Form (SFMTA Form No. 6). If Contractor does not submit SFMTA Form No. 6 with its invoice, the SFMTA will notify the Contractor of the omission. If Contractor’s failure to provide SFMTA Form No. 6 is not explained to the SFMTA’s satisfaction, full or partial payment may be withheld until Contractor submits the completed SFMTA Form No. 6.

4.5.8. SBE Payment and Utilization Tracking System. Contractor shall pay SBE/DBE subcontractors within three business days of the SFMTA’s payment of an invoice. Within 10 business days of the SFMTA’s payment of an invoice, Contractor shall confirm to the SFMTA that all subcontractors have been paid via the B2Gnow System (<https://sfmta.diversitycompliance.com/>). Failure to submit all required payment information into B2Gnow may result in full or partial withholding of future progress payment requests until Contractor submits the required information.

4.5.9. Contractor Payment

(a) The City utilizes the Paymode-X® service offered by Bank of America Merrill Lynch to pay City contractors. Contractor must sign up to receive electronic

payments to be paid under this Agreement. To sign up for electronic payments, visit <http://portal.paymode.com/citycountyofsanfrancisco>.

(b) The City may require Contractor to submit invoices directly in the City's financial and procurement System (PeopleSoft) via eSettlement. Refer to <https://sfcitypartner.sfgov.org/pages/training.aspx> for more information on eSettlement. For access to PeopleSoft eSettlement, submit a request through sfemployeeportalsupport@sfgov.org.

4.5.10. Grant-Funded Contracts

(a) **Disallowance.** If Contractor requests or receives payment from City for Services, reimbursement for which is later disallowed by the State of California or United States Government, Contractor shall promptly refund the disallowed amount to City upon City's request. In its discretion, City may offset the amount disallowed from any payment due or to become due to Contractor under this Agreement or any other Agreement between Contractor and City.

(b) **Grant Terms.** The funding for this Agreement is provided to the SFMTA in full or in part by a federal or State grants. As part of the terms of receiving the funds, the SFMTA must incorporate some of the terms of that grant agreement into this Agreement ("Grant Terms"). The incorporated Grant Terms are stated in Appendix G (Federal Contract Requirements). To the extent that any Grant Term is inconsistent with any other provisions of this Agreement such that Contractor is unable to comply with both the Grant Terms and the other provision(s), the Grant Terms shall apply.

(c) **Subcontractors.** As required by the Grant Terms, Contractor shall insert applicable provisions into each lower-tier subcontract. Contractor is responsible for compliance with the Grant Terms by its subcontractors, Affiliates, lower-tier subcontractors, or service providers.

4.6. Audit and Inspection of Records. Contractor agrees to maintain and make available to the City, during regular business hours and subject to the Contractor's security protocols, accurate books and accounting records relating to the Project and the Services. Contractor will permit City to audit, examine, and make excerpts and transcripts from such books and records, and to make audits of all invoices, Materials, payrolls, records or personnel and other data related to all other matters covered by this Agreement, whether funded in whole or in part under this Agreement. Contractor shall maintain such data and records in an accessible location and condition for a period of not less than five years after final payment under this Agreement or until after final audit has been resolved, whichever is later. The State of California or any federal agency having an interest in the subject matter of this Agreement shall have the same rights as conferred upon City by this Section. Contractor shall include the same audit and inspection rights and record retention requirements in all subcontracts. The City's rights under this Section 4.6 (Audit and Inspection of Records) are in addition to the audit provisions stated in Appendix G (Federal Contract Requirements).

4.7. Submitting False Claims. The full text of San Francisco Administrative Code Chapter 21, Section 21.35, including the enforcement and penalty provisions, is incorporated into this Agreement. Pursuant to San Francisco Administrative Code §21.35, any contractor, Affiliate, or subcontractor who submits a false claim shall be liable to the City for the statutory penalties set forth in that section. A contractor, Affiliate or subcontractor will be deemed to have

submitted a false claim to the City if the contractor, Affiliate, or subcontractor: (a) knowingly presents or causes to be presented to an officer or employee of the City a false claim or request for payment or approval; (b) knowingly makes, uses, or causes to be made or used a false record or statement to get a false claim paid or approved by the City; (c) conspires to defraud the City by getting a false claim allowed or paid by the City; (d) knowingly makes, uses, or causes to be made or used a false record or statement to conceal, avoid, or decrease an obligation to pay or transmit money or property to the City; or (e) is a beneficiary of an inadvertent submission of a false claim to the City, subsequently discovers the falsity of the claim, and fails to disclose the false claim to the City within a reasonable time after discovery of the false claim.

ARTICLE 5 WORK AND RESOURCES

5.1. Scope of Work. This Agreement provides the legal and procedural framework for Contractor’s provision of the Services. Contractor agrees to perform the Work as generally described in this Agreement, and as more particularly described in Appendix A (Contract Specifications), including but not limited to design, procurement of Equipment, Materials and Software, oversight of Equipment installation, assistance with Legacy Systems integration, implementation and testing of the CBTC, providing Support Services, spare parts, Updates and Upgrades to the Software, and such Incidental Work as necessary to meet the requirements of and achieve the purposes of this Agreement. The Contractor will not perform any work that constitutes a public work or construction (that is, work that requires a California contractor’s license), including the installation of wayside Equipment. The SFMTA will contract with third-party Installers to perform LRV and wayside Equipment installation. The Contract Specifications state System performance requirements. Except as expressly otherwise stated in this Agreement, the SFMTA is not specifying the means and methods by which Contractor will implement a System solution.

5.2. Exercise of Options. The SFMTA has eight (8) Options under this Contract. Options 1, 2 and 3 provide for Contractor’s provision of additional Vehicle Equipment, as described in Contract Specifications, Section 2.4 (CBTC Fleet Options). Option 4 provides for purchase of additional Interlocking Equipment, as described in Contract Specifications Section 16.2 (System Architecture). Option 5 provides for purchase of additional Central Emergency Stop Buttons for Backup Control Center, as described in Contract Specifications Section 27.7.3 (Workstations). Option 6 provides for additional design services common to Heritage and/or Maintenance Vehicles, from PDR to Final Design. Options 7 and 8 are five-year extensions to the Support Term, as described in Article 3 (Contract Term). Contractor shall perform the Work described as Options in the referenced Contract provisions following written notice from the SFMTA.

5.3. Additional Work. Officers and employees of the City are not authorized to request, and the City is not required to reimburse Contractor for, Services beyond the Services described in this Agreement (“Additional Work”) unless this Agreement is modified to include those Services in accordance with Section 12.5 (Contract Modifications and Change Orders).

5.4. Services Provided by Attorneys. Any services to be provided by a law firm or attorney to this Project must be reviewed and approved in writing in advance by the City Attorney. No invoices for services provided by law firms or attorneys, including, without limitation, as Affiliates or subcontractors of Contractor, will be paid unless Contractor and law firm or attorney have received advance written approval from the City Attorney.

5.5. Reports. Contractor shall submit written reports and other written Deliverables as requested by the SFMTA. Format for the content of such reports shall be determined by the SFMTA. The timely submission of all reports is a necessary and material term and condition of this Agreement. The reports, including any copies, shall be submitted electronically. When requested by SFMTA, report shall be printed on recycled paper and using double-sided pages to the maximum extent possible.

5.6. Department Liaison. Contractor's liaison with the SFMTA will be Dan Howard, SFMTA, 1455 Market Street, 7th floor, San Francisco, CA 94103; 415-646-4119; dan.howard@sfmta.com.

5.7. Parties' Roles and Responsibilities. Contractor's and City's respective obligations to implement the System are stated in this Agreement. The City's roles and responsibilities for the Project are expressly identified as City obligations; all other obligations stated in this Agreement are assigned to and are the responsibility of Contractor.

5.8. Contractor's Personnel

5.8.1. Qualified Personnel. Contractor shall use only competent personnel under the supervision of, and in the employment of, Contractor (or Contractor's authorized Affiliates and Subcontractors) to perform the Work. Contractor will comply with City's reasonable requests regarding assignment and/or removal of personnel, but all personnel, including those assigned at City's request, must be supervised by Contractor. Contractor shall commit adequate resources to allow timely completion within the "Days From NTP" column of the Milestone Schedule.

5.8.2. Key Personnel. The SFMTA selected Contractor in large part due to the particular experience and expertise of the Key Personnel listed below. Contractor shall provide the SFMTA not less than three-months' notice prior to reassigning Key Personnel. Contractor shall not reassign said personnel to other Projects or assignments without the express written approval of the SFMTA. Contractor agrees that the following Key Personnel shall be committed and assigned to provide Services under this Agreement to the level required by SFMTA for as long as necessary to complete the portions of the Work assigned to them, and said Key Personnel shall be located at the project office in San Francisco while assigned to the Project:

Ghislain LeDantec, Project Manager
Darryl Radstake, Lead Engineer
Nenad Boras, Lead Vehicle Engineer
Don Gonzales, System Assurance Manager
Irfan Siddiqui, Quality Assurance Manager
Anthony Daniel, Test and Commissioning Lead
Maryam Rahimi, Safety and Security Manager
Vadim Ayvazov, Technical Support Lead

5.8.3. Replacement of Key Personnel. Contractor shall replace existing Key Personnel only with persons with equal or better experience and expertise. All replacement Key

Personnel are subject to the approval of the SFMTA, which will not be unreasonably withheld or unduly delayed. Contractor shall provide the SFMTA the complete resume (academic and work history) of proposed replacement Key Personnel not less than two weeks prior to their first day of work on this Contract. The SFMTA shall have no obligation to pay Contractor for any Work performed by replacement Key Personnel who the SFMTA have not approved.

5.8.4. Liquidated Damages for Unauthorized Replacement of Key Personnel. Contractor acknowledges that the SFMTA's selection of Contractor and negotiated compensation stated in the Contract Amount were based, in part, on the expertise and experience of Contractor's proposed Key Personnel as submitted in the Proposal. Contractor acknowledges and agrees that the replacement of Key Personnel during the course of the Project would be extremely disruptive and damaging to the City, the cost of which is difficult, if not impossible, to calculate. Contractor, therefore, shall pay to the City a charge of Five Hundred Thousand Dollars (\$500,000) for the first Key Personnel whom Contractor reassigns without written approval by the City. For each additional Key Personnel whom Contractor reassigns without written approval by the City, Contractor shall pay to the City a charge of Six Hundred Thousand Dollars (\$600,000). Said charges shall not be considered or act as a penalty, but shall be liquidated damages to the City to compensate the City for the additional costs and inefficiencies to the Project that the Parties agree will necessarily arise from the unauthorized departure of Key Personnel. Should the City require Contractor to replace or reassign any of its personnel so that said persons are no longer working on the Project, the liquidated damages provisions of this Section 5.8.4 shall not apply.

5.8.5. Key Personnel Training Period. If the SFMTA approves Contractor's request to reassign any Key Personnel, Contractor shall provide a training period of not less than four weeks during which the departing Key Personnel will train their replacement on the aspects of the Project for which they will be responsible. If Contractor is replacing Key Personnel who have left Contractor's employment, Contractor shall provide as much training as is feasible between the date Contractor was notified of the departure and the day of termination of the departing Key Personnel's employment with Contractor, during which the departing Key Personnel will train their replacement on the aspects of the Project for which they will be responsible. Contractor shall bear all expenses arising from the replacement of Key Personnel, including but not limited to the salary costs of the replacement Key Personnel during the training period.

5.8.6. Reassignment of Personnel. The SFMTA reserves the right to require Contractor to reassign (remove) from the Project any person under Contractor's control (including employees, Affiliates, subcontractors, and consultants) if the SFMTA is unsatisfied with that person's performance, is offensive, or fails to demonstrate the required qualifications or expertise necessary to perform the Work.

5.8.7. Current Workload and Available Resources. Contractor shall ensure that its other projects, contracts, and obligations do not limit the availability of Contractor's personnel and resources necessary for Contractor to perform the Work and complete the Project and its Milestones and subordinate tasks, within the periods specified or otherwise provided in this Agreement and Contract Schedule. Requirements concerning the development, review and update of the Contract Schedule are set out in Contract Specifications, Section 3.2.4 (Schedules). Contractor shall ensure that its personnel, Affiliates, and subcontractors necessary to perform

particular tasks or portions of the Services are available to perform their assigned parts of the Services in accordance with the Contract Schedule.

5.9. Transmittal of Work Product. When requested by the SFMTA, the Contractor shall transmit to Agency all work product produced or accumulated in the course of its and its Subcontractors' and Affiliates' work on this Agreement. The Contractor's Project Manager and Key Personnel shall have thoroughly reviewed and approved the work product prior to transmitting it to Agency. Contractor may retain copies of work product for its own reference, but for no other purpose.

5.10. Subcontracting

5.10.1. Subcontracts. Contractor may subcontract portions of the Work only upon prior written approval of City. Portions of Work subcontracted to Affiliates are not subject to said prior written approval, but the Contractor must notify the SFMTA of the identity of each Affiliate before it begins to perform Work on the Contract. Contractor shall closely monitor and is responsible for its Subcontractors' and Affiliates' performance of Work. All subcontracts must incorporate the terms of Article 11 (Additional Requirements Incorporated by Reference) of this Agreement. Neither Party shall contract on behalf of, or in the name of, the other Party to perform any Work under this Agreement. Any agreement made in violation of this provision shall be null and void.

5.10.2. List of Subcontractors. City's execution of this Agreement constitutes its approval of the Subcontractors listed below.

Syntony SAS

Anta Electric

SacTown Logistics, LLC

Clark Transportation Consulting & Services, LLC DBA Bison Rail Systems

Accio Ads LLC dba Veterans Logistics Group

5.11. Independent Contractor; Payment of Employment Taxes and Other Expenses

5.11.1. Independent Contractor

(a) For the purposes of this Section 5.11, "Contractor" shall be deemed to include not only Contractor, but also any agent or employee of Contractor. Contractor acknowledges and agrees that at all times, Contractor or any agent or employee of Contractor shall be deemed at all times to be an independent contractor and is wholly responsible for the manner in which it performs the services and work requested by City under this Agreement.

(b) Contractor, its agents, and employees will not represent or hold themselves out to be employees of the City at any time. Contractor or any agent or employee of Contractor shall not have employee status with City, nor be entitled to participate in any plans, arrangements, or distributions by City pertaining to or in connection with any retirement, health or other benefits that City may offer its employees. Contractor or any agent or employee of Contractor is liable for the acts and omissions of itself, its employees and its agents. Contractor shall be responsible for all obligations and payments, whether imposed by federal, any state or local law, including, but not limited to, FICA, income tax withholdings, unemployment

compensation, insurance, and other similar responsibilities related to Contractor's performing services and work, or any agent or employee of Contractor providing same. Nothing in this Agreement shall be construed as creating an employment or agency relationship between City and Contractor or any agent or employee of Contractor.

(c) Any terms in this Agreement referring to direction from City shall be construed as providing for direction as to policy and the result of Contractor's work only, and not as to the means by which such a result is obtained. City does not retain the right to control the means or the method by which Contractor performs work under this Agreement.

(d) Contractor agrees to maintain and make available to City, upon request and during regular business hours, accurate books and accounting records demonstrating Contractor's compliance with this Section.

5.11.2. Payment of Employment Taxes and Other Expenses. Should City, in its discretion, or a relevant taxing authority such as the Internal Revenue Service or the State Employment Development Division, or both, determine that Contractor is an employee for purposes of collection of any employment taxes, the amounts payable under this Agreement shall be reduced by amounts equal to both the employee and employer portions of the tax due (and offsetting any credits for amounts previously paid by Contractor which can be applied against this liability). City shall then forward those amounts to the relevant taxing authority. Should a relevant taxing authority determine a liability for past services performed by Contractor for City, upon notification of such fact by City, Contractor shall promptly remit such amount due or arrange with City to have the amount due withheld from future payments to Contractor under this Agreement (again, offsetting any amounts already paid by Contractor which can be applied as a credit against such liability). A determination of employment status pursuant to this Section 4.8 shall be solely limited to the purposes of the particular tax in question, and for all other purposes of this Agreement, Contractor shall not be considered an employee of City. Notwithstanding the foregoing, Contractor agrees to indemnify and save harmless City and its officers, agents and employees from, and, if requested, shall defend them against any and all claims, losses, costs, damages, and expenses, including attorneys' fees, arising from this Section.

5.12. Assignment. The Work that Contractor shall perform under this Agreement are personal in character. Neither this Agreement nor any duties or obligations hereunder may be directly or indirectly assigned, novated, hypothecated, transferred, or delegated by Contractor, or where Contractor is a joint venture, a joint venture partner (collectively referred to as an "Assignment"), unless first approved by City by written instrument executed and approved as required under City law and under the policy of the SFMTA Board of Directors. The City's approval of any such Assignment is subject to Contractor demonstrating to City's reasonable satisfaction that the proposed transferee is: (a) reputable and capable, financially and otherwise, of performing each of Contractor's obligations under this Agreement and any other documents to be assigned, (b) not forbidden by applicable law from transacting business or entering into contracts with City; and (c) subject to the jurisdiction of the courts of the State of California. Contractor shall immediately notify City about any Assignment. Any purported Assignment made in violation of this provision shall be null and void. (See also Section 5.20 ("Business Discontinuation."))

5.13. Standard of Care. Contractor agrees that the design and implementation of the CBTC are specialized engineering services. The standard of care applicable to the Contractor

shall be that the Services will be performed with the degree of skill and care that is required by current, good and sound professional procedures and practices, and in conformance with generally accepted professional standards applicable to communications based train control systems and other passenger rail train control systems prevailing at the time the Services are performed, so that all Services that Contractor provides are correct and appropriate for the purposes contemplated in this Agreement. Said standards shall conform to IEEE 1474 series and applicable AREMA standards.

5.14. Notice of Deficiency and Demand to Cure. Should City determine that Contractor, or any agent or employee of Contractor, is not performing in accordance with the requirements of this Agreement, City shall provide Contractor with written notice of such failure. Within five business days of Contractor's receipt of such notice, and in accordance with Contractor policy and procedure, Contractor shall remedy the deficiency or present a plan to remedy the deficiency that is acceptable to the City. Notwithstanding, if City believes that an action of Contractor, or any agent or employee of Contractor, warrants immediate remedial action by Contractor, City shall contact Contractor and provide Contractor in writing with the reason for requesting such immediate action.

5.15. Equipment and Software Warranties. Contractor's warranty obligations are described in Contract Specifications, Section 13 (Warranty and Spare Parts).

5.16. Delivery of Equipment, Software and Materials

5.16.1. Delivery of Fitment. Contractor shall deliver all Equipment and procured Materials to the SFMTA according to the Contract Schedule to ensure that the Equipment and procured Materials needed for Fitment are available to the Installers before said Equipment and Materials are needed for Installation. Contractor shall be subject to Liquidated Damages described in Section 5.18.11 (Liquidated Damages for Late Delivery) arising from or related to Contractor's later delivery to the SFMTA of Equipment and procured Materials.

5.16.2. Transfer of Title. Title of all Equipment and procured Materials shall transfer to the SFMTA upon the SFMTA's payment for the item(s), irrespective of possession of said item(s) and irrespective of whether the SFMTA has conditionally accepted the items. Payment for Equipment, Software, and procured Materials shall not constitute acceptance of the item(s) and is not a waiver of any requirement of the Contract.

5.16.3. Risk of Loss. Contractor shall bear all risk of loss of Equipment, Software and other Contractor-procured Materials, including any damage or loss sustained during transportation from Contractor's (or its supplier's) point of origin, until the SFMTA accepts in writing the delivery of the Equipment, Software and Materials. Until written acceptance of delivery, Contractor shall insure all Equipment, Software and Materials against damage and loss, regardless of whether said items are in Contractor's possession, in transit, or in the SFMTA's possession. See Section 6.1 (Insurance and Indemnity).

5.17. Project Schedule

5.17.1. Schedules. Contractor shall prepare, maintain and update the Project Schedule as provided in Contract Specifications, Section 3.2.4 (Schedules).

5.17.2. Wayside Work Moratorium; Interference with Transit Operations. For any Work that Contractor performs, including System testing, that requires a Closure or is Work performed on the wayside, in Stations, or on platforms that may interfere with Revenue

Service, Contractor shall schedule that Work in accordance with the requirements for track, tunnel and wayside access provided in Appendix J, Item 1 (Track and Tunnel Access Procedures). Contractor shall confer with SFMTA in planning its Project Schedule and schedule updates to confirm that Contractor's planned Work activities will not interfere with Revenue Service, other transit operations, transit infrastructure maintenance and repairs, and other SFMTA activities.

5.17.3. Incidental Work. Contractor's costs and or time expended related to or arising from planning, scheduling, and coordinating Closures to accommodate holiday moratorium periods, Revenue Service and other transit operations are Incidental Work for which Contractor shall not receive additional compensation.

5.18. Delay, Force Majeure, and Liquidated Damages

5.18.1. Delay. Time is of the essence in Contractor's performance of the Work. See Section 12.15 (Time is of the Essence). By entering into this Agreement, Contractor agrees that in the event the progress or completion of the Work is delayed beyond the scheduled Milestones and other Work completion deadlines as provided in the approved Contract Schedule, as may be revised by Contract Modifications, City will suffer damages that will be impracticable or extremely difficult to determine. Contractor further agrees that the amounts listed as liquidated damages in the Agreement for each Day or hour of delay beyond scheduled Milestones and timelines are not a penalty but are a reasonable estimate of the loss that City will incur based on the delay, established in light of the circumstances existing at the time this Contract was Awarded. Except where the delay is the result of an Unavoidable Delay, City may deduct a sum representing said liquidated damages from any money due to Contractor (including Retained Funds). Such deductions shall not be considered a penalty but are agreed monetary damages and compensation for losses the City has sustained because of Contractor's failure to deliver the Work or specified element of the Work to City within the time stated in the Agreement, as it may be amended.

5.18.2. Unavoidable Delay. An Unavoidable Delay is an interruption of the Work beyond the control of Contractor, which Contractor could not have avoided by the exercise of care, prudence, foresight, and diligence. Such delays include and are limited to (1) Force Majeure Events; (2) changes in the Work ordered by the City insofar as they necessarily require additional time in which to complete the entire Work; (3) delays caused by the City of Contractor's commencing or performing the Work; or (4) delays caused by Installers or other contractors employed by the City insofar as Contractor does not contribute to the delays. The duration of said Unavoidable Delays shall be limited to the extent that the commencement, prosecution, and completion of the Work are delayed thereby.

5.18.3. Notification of Delay. Contractor shall notify SFMTA as soon as Contractor has, or should have, knowledge that an event has occurred that will delay the Work beyond Milestones or the Project Final Completion date. Within 10 Days, Contractor shall confirm such notice in writing, furnishing as much detail as is available, including whether the Contractor asserts that: (1) the delay was caused by a Force Majeure Event; or (2) the City is liable for the delay.

5.18.4. Request for Extension. After notification of the delay, Contractor shall submit claims for compensation and extension of time through a Request for Contract Change under the procedure set forth in Appendix E (Clarifications and Changes in the Work). The

granting of an extension of time because of Unavoidable Delays for a specific delay shall in no way operate as a waiver on the part of the City of the right to collect liquidated damages for other delays or of any other rights to which the City is entitled for other delays.

5.18.5. Liability. For an Unavoidable Delay that is caused, directly or indirectly, by a Force Majeure Event, the affected Party will be entitled to an extension of time in accordance with Section 5.18.6 below, and will not be entitled to additional compensation. For all other Unavoidable Delays described in Section 5.18.2 above, Contractor shall be entitled to an equitable adjustment to the Contract Term and/or an increase in the Contract Amount to the extent the delay is caused by the SFMTA, its Installers or its other contractors. In the case of a Force Majeure Event, Contractor shall immediately commence disaster recovery services as described in Section 5.18.8 (Disaster Recovery).

5.18.6. Duration. In a Force Majeure Event, the non-performing Party shall be excused from further performance or observance of the obligation(s) so affected for as long as such circumstances continue, and such Party continues to use its best efforts to recommence performance or observance whenever and to whatever extent possible without delay. Any Party so delayed in its performance shall notify the Party to whom performance is due by telephone as soon as it becomes aware of the Force Majeure Event (to be confirmed in writing within five (5) days of the notification of such delay) and describe at a reasonable level of detail the circumstances causing such delay.

5.18.7. Effect. If a Force Majeure Event substantially prevents, hinders, or delays performance of the Services as critical for more than one hundred and twenty (120) consecutive Days, then the City may: (i) terminate any portion of this Agreement so affected in accordance with the provisions set forth in Section 9.1 Termination for Convenience; or (ii) terminate this Agreement without liability to City or Contractor as of a date specified by City in a written notice of termination to Contractor. Contractor shall not have the right to any additional payments from City for costs or expenses incurred by Contractor as a result of any force majeure condition that lasts longer than three (3) days.

5.18.8. Disaster Recovery. Contractor shall provide disaster recovery services in accordance with the provisions of the Disaster Recovery Plan contained in the Project Management Plan (see Contract Specifications, Section 3.2.3) or as otherwise set forth in this Agreement. A Force Majeure Event shall not excuse Contractor of its obligations for performing disaster recovery services as provided in this Agreement.

5.18.9. Liquidated Damages for Transit Service Interruption. The SFMTA will operate Revenue Service throughout the Contract Term (in both the Procurement Term and Support Term) on rail lines on which or in close proximity to areas where Contractor will need to perform Work. The SFMTA and Contractor must carefully coordinate Contractor's performance of the Services to minimize disruption of transit services. The SFMTA will schedule temporary rail service suspensions ("Closures") of portions of its rail network to accommodate Contractor's performance of the Services, in accordance with permits and clearances requested by Contractor and granted by SFMTA. A Closure will significantly impact public transit services. A Closure will require the SFMTA to limit or completely suspend transit service along an affected rail line and will require the SFMTA to expend substantial resources to plan and to perform community outreach and manage public relations to inform affected passengers and neighborhoods prior to a Closure, and to plan, resource, and staff alternate transit services (including bus bridges). In

consideration of those expenditures and other costs, damages and impacts, the value of which would be difficult or impossible to calculate at the time of Contractor’s failure to provide timely notice of a Closure or delay in returning a rail line to Revenue Service following a Closure, the liquidated damages provided below do not constitute a penalty but represent a fair estimate of the damages the SFMTA will incur and impacts to the public arising from said lack of timely notice or delay, in light of the circumstances and facts known at the time of Contract Award.

(a) Liquidated Damages for Requesting Closures on Short Notice.

Contractor shall request Closures as provided in the SFMTA Track and Tunnel Access Procedures in Appendix J (SFMTA Policies and Procedures). As provided in those Track and Tunnel Access Procedures, Contractor shall request a Closure not less than 180 Days in advance of the requested Closure date, (or within such time prescribed in the version of the Track and Tunnel Access Procedures in effect at time of the request), so that the SFMTA has adequate time to evaluate impacts on transit service, plan for alternate service, and inform the public of the dates and times of each Closure. In the event that Contractor requests a Closure or modifies a request for a Closure such that the dates and times of the Closure change from those specified in the original request, and that new request or modification results in the SFMTA having fewer than the minimum number of Days specified in the SFMTA Track and Tunnel Access Procedures, Contractor shall pay liquidated damages in the amount of Thirty-Five Thousand Dollars (\$35,000).

(b) Liquidated Damages for Exceeding Closure Period.

Contractor shall manage its work and perform the Services during a Closure to ensure that the closed rail line is reopened to Revenue Service as scheduled in the Closure permit. In the event that Contractor does not vacate a trackway or rail line as scheduled or occupies a trackway or rail line or otherwise interferes with and delays the SFMTA’s re-opening a rail line or trackway to Revenue Service beyond the time stated in a Closure permit Contractor shall pay the SFMTA the sum(s) stated in the following Liquidated Damages Schedule:

Day Period	Del	D Value \$	L
First hour (or fraction thereof)	Firs	35,000	\$
Two hours or less	Tw	40,000	\$
Three hours or less	Fou	50,000	\$
Over 4 hours	Ove	100,000	\$
For each additional Day	For	100,000	\$

(c) Liquidated Damages for Cancelling or Postponing a Closure.

Contractor acknowledges and agrees that a Closure is a significant event that may require the SFMTA to expend substantial resources to plan, schedule and staff alternate transit services (such as bus bridges) to maintain minimum transit services during a Closure, and to perform community outreach and manage public relations to inform affected passengers and neighborhoods prior to a Closure. In consideration of those and other costs, damages and other impacts that are difficult or impossible to calculate, if Contractor cancels or otherwise postpones the commencement of a Closure as specified for which the SFMTA has already expended planning resources and provided notice of the Closure to the public, Contractor shall pay to the SFMTA the sum of Fifty Thousand Dollars (\$50,000) as compensation for the SFMTA's costs to inform the public and provide resources to inform the public of the delay to the Closure and/or reschedule the Closure.

5.18.10. Liquidated Damages for Project Delays. A fully functioning train control system is critical to the SFMTA's providing safe and efficient transit services. The intent and purpose of this Agreement is to procure and implement a CBTC to replace of the SFMTA's existing train control system (ATCS), which due to age is deteriorating, resulting in ATCS equipment malfunctions and ATCS outages that delay and otherwise impact transit service. If Contractor delays the final completion of the Project or delays completion of Project Milestones, the SFMTA will suffer damages arising from continuing and additional delays and other impacts to transit service caused by ATCS malfunctions and downtime that would have been avoided but for said Contractor delays. Said damages would be impractical or extremely difficult to calculate at time the delay occurs, which involve loss of public use, loss of fare revenue, and loss of the SFMTA's reputation in addition to the direct labor, equipment, and administrative costs that the SFMTA would incur in operating its rail transit services in manual mode and providing alternate transit services. Contractor therefore agrees that the SFMTA may assess liquidated damages for said Contractor's delays, as set out in the following sections. Said liquidated damages do not constitute a penalty but are a reasonable estimate of the losses that City will incur arising from delay, based on the information available and the circumstances existing at the time this Agreement was Awarded.

(a) In the event that the Subway Cutover Date (Milestone 5.7) is delayed by Contractor beyond the date stated in the approved Milestone Schedule, the City will suffer actual damages that will be impractical or extremely difficult to determine. Contractor therefore agrees that it will pay the SFMTA the sum of Forty Thousand Dollars (\$40,000) for each Day the scheduled Subway Cutover is delayed.

(b) In the event that the Final Commissioning Date (Milestone 10.7) is delayed by Contractor beyond the date stated in the approved Milestone Schedule, the City will suffer actual damages that will be impractical or extremely difficult to determine. Contractor therefore agrees that it will pay the SFMTA the sum of Thirty Thousand Dollars (\$30,000) for each Day the scheduled Final Commissioning Date is delayed.

5.18.11. Liquidated Damages for Late Delivery. Even though Contractor will not perform installation services, timely installation of the system is dependent on Contractor's timely completion of its delivery obligations under the Contract. If delivery of Equipment or Materials is delayed beyond the date specified for the delivery in the approved Project Schedule under Contract Specification section 3.2.4.2, Project Schedule, the SFMTA will suffer damages, including delay claims against the SFMTA from its Installers and the

postponement of scheduled Closures for installation work, that will be impractical or extremely difficult to determine. Contractor therefore agrees that it will pay the SFMTA the sum of Fifty Thousand Dollars (\$50,000) for each Day that the scheduled delivery of a shipment of Equipment or Materials is delayed.

5.18.12. General Liquidated Damages Provisions

(a) City may deduct a sum representing assessed liquidated damages from any money due to Contractor under this Agreement (including Retained Funds).

(b) The SFMTA will not assess liquidated damages that cause the total liquidated damages assessed during the Procurement Term to exceed an aggregate limit of 10 percent of the Total System Procurement Price, as stated in Table 1 of Appendix B, as that amount may be modified by approved Contract Modifications and the SFMTA's exercise of Procurement Options in Table 2 of Appendix B. The SFMTA will not assess liquidated damages that cause the total liquidated damages assessed during the Support Term to exceed an aggregate limit of 10 percent of the Total Support Fee (See Appendix B, Table 3 (System Support Prices), Column D (Maximum Support Fee) (Schedule of Prices and Calculation of Charges), as the Total Support Fee may be amended by approved Contract Modifications and the SFMTA's exercise of Options to extend the Support Term. Liquidated Damages shall be the sole and exclusive remedy for the SFMTA for delay until the limits calculated under this section are exceeded.

(c) If the total amount of liquidated damages accrued by Contractor exceeds the limits stated in the preceding Section 5.18.12.2, this shall constitute a material breach of this Agreement, which the SFMTA may deem to be an Event of Default. See Section 9.2 (Termination for Default; Remedies).

(d) Contractor's payment of liquidated damages under any provision of this Contract shall not relieve Contractor from separate liability for liquidated damages under the other provision(s) of the Contract, each to the full extent of the specified amount, regardless of whether the times for which liquidated damages are to be paid do or do not run concurrently, or whether each liability is or is not a consequence of the other.

(e) The SFMTA's right to assess liquidated damages under the Contract does not reduce or compromise the SFMTA's rights to terminate the Contract for cause for excessive liquidated damages in accordance with Section 5.18.12.3, to terminate for convenience, to demand that Contractor cure any breach of the Contract, or to seek performance of the Contract under any bond that guarantees the performance of the Contract.

5.19. Bond Requirements

5.19.1. Procurement Term Performance Bond. Within 21 Days of the date the Agreement is Awarded, Contractor shall furnish a performance bond in a form acceptable to City (see Appendix F, Procurement Term Performance Bond), as a condition precedent to the Agency's issuance of the Notice to Proceed. Said Procurement Term Performance Bond shall guarantee Contractor's faithful performance of the Services and other requirements of the Contract during the Procurement Term until Final Acceptance as defined in Section 2 of the Contract. The bond must be approved as to sufficiency and qualifications of the surety by the City's Risk Manager. The sum of the Procurement Term Performance Bond shall not be less than 100 percent of the "Total System Procurement Price" stated in Table 1 of Appendix B (Schedule

of Prices and Calculation of Charges). At Subway Conditional Acceptance (Milestone 5.8 in Appendix C), Contractor may reduce the Procurement Term Performance Bond to not less than 60 percent of the “Total System Procurement Price” stated in Table 1 of Appendix B. At Final Acceptance the Procurement Term Performance Bond shall automatically terminate and shall be released by the City. The Surety shall have no obligation to provide the Support Term Performance Bond required under Section 5.19.2 of the Contract, and the failure of the Contractor to provide any Support Term Performance Bond shall not constitute a breach or default by the Surety under the terms of the Procurement Term Performance Bond, or give rise to any claim or cause of action against the Surety under the terms of the Procurement Term Performance Bond.

5.19.2. Support Term Performance Bond. 30 days before Final Acceptance, Contractor shall furnish a performance bond in a form acceptable to City (see Appendix F, Support Term Performance Bond) that will be effective at Final Acceptance and release of the Procurement Term Performance Bond. Said Support Term Performance Bond shall guarantee Contractor’s faithful performance of the Services and other requirements of the Contract during the Support Term after Final Acceptance. The bond must be approved as to sufficiency and qualifications of the surety by the City’s Risk Manager. The sum of the Support Term Performance Bond shall be not less than thirty percent (30%) of the base 10 year “Total Support Fee” (calculated as 12 x 10 x the Monthly Support Fee stated in Table 3 of Appendix B). Contractor may furnish an initial Support Term Performance Bond with a five-year term if the Contractor agrees that, at five-year intervals after Final Acceptance, Contractor will furnish an extension of the Support Term Bond or a replacement bond in a form acceptable to the City and approved by the City’s Risk Manager. Failure to furnish an extension of the Support Term Bond or replacement thereof when required will be an Event of Default of the Contractor under Section 9.2. The failure to renew or extend the term of the Support Term Performance Bond shall be at the sole discretion of the Surety at any time, and shall not constitute a breach or default by the Surety under the terms of the Support Term Performance Bond or give rise to any claim or cause of action against the Surety under the terms of the Support Term Performance Bond. The SFMTA may require a performance bond for each of the 5-year Options to extend the Support Term as a condition precedent of issuing NTP for that Option. If the SFMTA requires a bond for each Support Option, which will be not more than [30%] of the price for the Support Option, the SFMTA will add the cost of the bond to the Option price.

5.20. Business Discontinuation. Contractor agrees that in the event it exits the train control business or otherwise ceases to market and/or ceases to provide maintenance and support services to the SFMTA and other transit agencies that utilize Contractor’s CBTC systems, and Contractor has no successor in interest by merger, operation of law, assignment, purchase, or otherwise, notwithstanding any other remedy that that the City may have under the Agreement or at law, Contractor shall provide City not less than 24 months’ notice prior to ceasing operations and Support, and shall make available to the SFMTA all Equipment that the SFMTA determines that it will require to operate the CBTC for whatever period the SFMTA may determine is necessary to procure and cutover to another train control system. Contractor shall also under those circumstances provide the SFMTA without charge, one (1) copy of the then-current Source Code for all of the programs and all supporting Documentation for the Software then operating in the CBTC. If City should obtain the Source Code and the Documentation pursuant to this Section 5.20, the only use made of the Source Code and the Documentation will be for the

operation and maintenance of the CBTC in connection with City's use of the CBTC as provided for, and limited by, the provisions of this Agreement.

ARTICLE 6 INSURANCE AND INDEMNITY

6.1. Insurance. Without in any way limiting Contractor's liability pursuant to the "Indemnification" provisions of this Agreement (see Article 7, Liability of the Parties), Contractor shall maintain in full force and effect the insurance as described in this Article from the Effective Date of this Agreement until this Agreement expires or is terminated, with the minimum specified coverages stated below or as required by applicable laws and regulations, whichever is greater. Subject to approval by the City's Risk Manager, Contractor may use umbrella insurance policies to supplement primary insurance policies or other established insurance programs, provided that the protection afforded to the City by such alternate insurance programs and the aggregate coverage for any claim is not reduced below the coverage levels specified herein. Subject to approval by the City's Risk Manager, if the specified insurance coverage would result in Contractor obtaining duplicative coverage, subject to proof, Contractor may combine species of coverage under a single policy. All coverage amounts are listed in United States Dollars.

6.1.1. Worker's Compensation Insurance. Contractor shall provide workers compensation insurance in statutory amount, including Employers' Liability coverage with limits not less than \$2,000,000 each accident, injury, or illness, including coverage, as Contractor determines to be applicable, for U.S. Long Shore and Harbor Workers' Act benefits and Jones Act benefits, and Federal Employers Liability Act. The Worker's Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by Contractor, its employees, agents, Affiliates, and subcontractors.

6.1.2. Commercial General Liability Insurance. Contractor shall provide commercial general liability (CGL) insurance with coverage limits not less than One-Hundred Million Dollars (\$100,000,000) each occurrence, and One-Hundred Million (\$100,000,000) annual aggregate, for bodily injury and property damage, including coverage for Contractual Liability, Personal Injury, Products, Completed Operations, independent Contractor, Explosion, Collapse, and Underground (XCU). and property damage, including coverage for Contractual Liability. Said CGL policy shall not contain any limitation or exclusion that would preclude a claim provided for by the Article 6 (Insurance and Indemnity) or Article 7 (Liability of the Parties) of this Agreement. Administrative costs of claims, including but not limited to legal costs and attorney's fees, shall not be accounted against or otherwise reduce the value of the insurance available to cover an insured loss. Should a claim or claims be paid by said policy that total(s) in the aggregate more than \$5,000,000, Contractor shall within ten (10) Days of receipt of such claim(s) provide notice of same to the SFMTA and obtain additional insurance so that Contractor's Work under Agreement is at all times fully covered as specified herein.

6.1.3. Commercial Automobile Liability Insurance. Contractor shall provide Commercial Automobile Liability Insurance with limits not less than Five Million Dollars (\$5,000,000) each occurrence combined single limit for Bodily Injury and Property Damage, including Owned, Hired Or Non-Owned vehicles coverage, as applicable.

6.1.4. Risk of Loss Insurance. Contractor shall insure Equipment, Software and procured Materials against loss for full replacement value, including shipping costs, until the

City's Conditional Acceptance of the Equipment following its installation and Commissioning to Revenue Service in a completed Phase. Said insurance shall cover against all losses of Equipment, Software and Materials in transit and in storage, until the SFMTA has taken possession of them, regardless of whether title has transferred to the SFMTA. Contractor shall provide Bailee's Insurance in a form appropriate for the nature of City property in the care, custody, or control of Contractor, on an all-risk form, for the total (100%) of the replacement value of the stored items. Contractor shall provide Cargo Insurance in a form appropriate for the nature of City property while in transit, on an all-risk form for the total (100%) replacement value of the shipped items. See Section 5.16.3 (Risk of Loss).

6.1.5. Professional Liability Insurance. Contractor shall provide Professional Liability Insurance applicable to Contractor's profession, with limits not less than Twenty Five Million Dollars (\$25,000,000) for each claim with respect to negligent acts, errors or omissions in connection with the Work.

6.1.6. Technology Errors and Omissions Liability. Contractor shall provide Technology Errors and Omissions Liability Insurance with limits of Fifty Million Dollars (\$50,000,000) for each claim and each loss. The policy shall at a minimum cover professional misconduct or lack of the requisite skill required for the performance of the Work and shall also provide coverage for the following risks:

(a) Network security liability arising from the unauthorized access to, use of, or tampering with computers or computer systems, including hacker attacks; and

(b) Liability arising from the introduction of any form of malicious software including computer viruses into, or otherwise causing damage to the CBTC System, the City's or third person's computer, computer system, network, or similar computer related property and the data, software, and programs thereon.

6.1.7. Cyber Insurance. Contractor initially shall provide Cyber Insurance with limits of not less than Ten Million Dollars (\$10,000,000) per claim. The Cyber Insurance limits shall be increased to Fifty Million Dollars (\$50,000,000) before installation of the primary Central Control Equipment (Milestone 2-1 as described in Appendix C). Such insurance shall include coverage for liability arising from theft, dissemination, and/or use of Confidential Information, including Security Sensitive Information and Critical Infrastructure Information. The City will not accept delivery of the Central Control Equipment until the Contractor furnishes to City evidence of the required increased coverage consistent with the requirements of Section 6.1.12.5 below.

6.1.8. Railroad Protective Liability Insurance. Contractor shall provide Railroad Protective Liability Insurance with limits of not less than Ten Million U.S. Dollars (\$10,000,000) per occurrence and Ten Million U.S. Dollars (\$10,000,000) in the aggregate annually for losses arising out of bodily injury to or death of all persons, and for physical loss or damage to or destruction of property, including the loss or use thereof. Coverage shall apply to Contractor's activities and operations performed within 50 feet vertically or horizontally of the centerline of BART's tracks, and of SFMTA Muni tracks, and of the Caltrain/Union Pacific rights-of-way. The language of said policy is subject to the approval of BART and the City's Risk Manager.

6.1.9. Waiver of Subrogation. The Workers' Compensation policy(ies) shall be endorsed with a waiver of subrogation in favor of the City for claims arising from or related to any Work performed by Contractor, its employees, agents, Affiliates, and subcontractors.

6.1.10. Additional Insured Entities

(a) Contractor's General Liability policies shall include the following entities as Additional Insureds to which Contractor owes a duty of indemnity and defense from claims and lawsuits, as provided in Section 6.2 (Indemnification):

(1) City and County of San Francisco, its board members and commissions, and all authorized agents and representatives, and members, directors, officers, trustees, agents, and employees of any of them.

(2) Bay Area Rapid Transit District (BART) and its board members, and all authorized agents and representatives, and members, directors, officers, trustees, agents, and employees of BART.

(b) Contractor's Commercial Automobile Insurance policies shall include the City and County of San Francisco, its board members and commissions, and all authorized agents and representatives, and members, directors, officers, trustees, agents, and employees of any of them as Additional Insureds to which Contractor owes a duty of indemnity and defense from claims and lawsuits, as provided in Section 6.2 (Indemnification).

6.1.11. Primary Insurance Endorsements

(a) The Commercial General Liability policy shall provide that such policies are primary insurance to any other insurance available to the Additional Insureds, with respect to any claims arising out of this Agreement, and that the insurance applies separately to each insured against whom claim is made or suit is brought.

(b) The Commercial Automobile Liability Insurance policy shall provide that such policies are primary insurance to any other insurance available to the Additional Insureds, with respect to any claims arising out of this Agreement, and that the insurance applies separately to each insured against whom claim is made or suit is brought.

6.1.12. Other Insurance Requirements

(a) All insurance policies required to be maintained by Contractor under this Agreement shall be endorsed to provide for thirty (30) Days prior written notice to the City of cancellation for any reason, intended non-renewal, or reduction in coverage. Said notices shall be sent to the persons and addresses list in Section 12.1 (Notices to the Parties). Contractor, upon notification of receipt by the City of any such notice, shall submit to the City a certificate of the required new or renewed policy at least 10 Days before the effective date of such cancellation, change or expiration, with a complete copy of new or renewed policy.

(b) Should any of the required insurance be provided under a claims-made form, Contractor shall maintain such coverage continuously throughout the Contract Term and, without lapse, for a period of three years beyond the expiration of this Agreement, to the effect that, should occurrences during the Agreement term give rise to claims made after expiration of the Agreement, such claims shall be covered by such claims-made policies.

(c) Should any of the required insurance be provided under a form of coverage that includes a general annual aggregate limit or provides that claims investigation or legal defense costs be included in such general annual aggregate limit, such general annual aggregate limit shall be double the occurrence or claims limits specified above.

(d) Should any required insurance lapse during the Contract Term, requests for payments originating after such lapse shall not be processed until the City receives satisfactory evidence of reinstated coverage as required by this Agreement, effective as of the lapse date. If insurance is not reinstated, the City may, in its sole discretion, suspend all Work at no cost to the City until such time as Contractor provides sufficient evidence that such insurance has been reinstated from the date that the insurance lapsed, or the City may terminate this Agreement effective on the date of such lapse of insurance.

(e) Within 15 Days of the Notice of Award of this Agreement, and before commencing any of the Work, Contractor shall furnish to City certificates of insurance and additional insured policy endorsements, in form evidencing all coverages set forth above. Approval of the insurance by City shall not relieve or decrease Contractor's liability hereunder.

(f) If Contractor will use any Affiliate(s) or subcontractor(s) to perform the Work, Contractor shall require the Affiliate(s) or subcontractor(s) to provide all necessary insurance and to name the City and County of San Francisco, its officers, agents and employees and Contractor as additional insureds.

(g) If Contractor is a joint venture partnership, each partner shall be jointly and severally liable for claims arising under or related to this Agreement, and no insurance policy providing coverage under this Agreement shall contain any provision prohibiting coverage of a joint venture partnership or otherwise limiting coverage of any joint venture partner or to any joint venture partner.

6.1.13. Insurer Qualifications. Insurance companies providing coverage for this Agreement shall be legally authorized to engage in the business of furnishing insurance in the State of California. All insurance companies shall have a current A.M. Best Rating not less than "A-,VIII" and shall be satisfactory to the City.

6.2. Indemnification

6.2.1. To the fullest extent permitted by California law, Contractor shall indemnify and hold harmless City and its officers, agents and employees from, and shall defend them from and against any and all claims, demands, losses, damages, costs, expenses, and liability for injury to or death of a person, including employees of City or Contractor; or loss of or damage to property to the extent caused by or arising from Contractor's negligent performance of this Agreement or willful misconduct, including, but not limited to, Contractor's use of facilities or equipment provided by City or others, except to the extent that such indemnity is void or otherwise unenforceable under applicable law, and except where such loss, damage, injury, liability or claim is the result of the active negligence or willful misconduct of City and is not contributed to by any act of, or by any omission to perform some duty imposed by law or agreement on Contractor, its Affiliates, Subcontractors, or either's agent or employee. The foregoing indemnity shall include, without limitation, reasonable fees of attorneys, Contractors and experts, investigation costs, and related costs directly arising from said claim(s).

6.2.2. In addition to Contractor's obligation to indemnify City, Contractor specifically acknowledges and agrees that it has an immediate and independent obligation to defend City from any claim which actually or potentially falls within this indemnification provision, even if the allegations are or may be groundless, false, or fraudulent, which obligation arises at the time such claim is tendered to Contractor by City and continues at all times thereafter.

6.2.3. The indemnification stated in this Section 6.2 (Indemnification) is subject to the City: (i) providing Contractor with prompt written notice of the claim; (ii) granting Contractor sole control of the defense to the claim, except that Contractor may not enter into any settlement that would adversely impact the City's rights or impose liability upon the City without the written consent of the City Attorney and the Director of Transportation (and the SFMTA Board of Directors, as applicable); and, (iii) providing reasonable cooperation in the defense of the claim, provided that the City shall not incur any expenses.

6.2.4. The terms, conditions, provisions, and failure to cover of any insurance policy covering Contractor's performance and obligations under this Agreement shall not operate to limit Contractor's Liabilities under this Agreement, nor shall the amount of insurance coverage operate to limit the extent of such Liabilities.

6.2.5. Contractor shall also indemnify and defend the Bay Area Rapid Transit District (BART) from premises liability claims and other lawsuits from third parties arising from Contractor's performance of the Services.

6.3. Intellectual Property Infringement

6.3.1. Contractor shall indemnify, defend and hold fully harmless City from all suits or claims for infringement of the patent rights, copyright, trade secret, trade name, trademark, service mark, or any other intellectual property claims or proprietary right of any person or persons in consequence of the use by City (and any Indemnitees) of any Equipment, Software, Applications, Deliverables, data or other items (Items) supplied or procured by Contractor for or in the performance of Services.

6.3.2. Infringement of patent rights, copyrights, or other proprietary rights in the performance of this Agreement, if not the basis for indemnification under the law, shall nevertheless be considered a material breach of contract.

6.3.3. To cure breach of this provision, Contractor shall at its sole expense and election, provided any such election does not result in any cost to the City, either: (1) indemnify the City; (2) obtain the right to use the infringing Item; or (3) modify the infringing Item so that it becomes non-infringing; or (4) replace the infringing Item with a non-infringing item that meets the requirements of this Agreement.

6.3.4. The indemnification stated in this Section 6.3 (Intellectual Property Infringement) is subject to the City: (i) providing Contractor with prompt written notice of the claim; (ii) granting Contractor sole control of the defense to the claim, except that Contractor may not enter into any settlement that would adversely impact the City's rights or impose liability upon the City without the written consent of the City Attorney and the Director of Transportation (and the SFMTA Board of Directors, as applicable); and, (iii) providing reasonable cooperation in the defense of the claim, provided that the City shall not incur any expenses.

6.3.5. Contractor shall have no obligations with respect to intellectual property infringements caused by: (1) Contractor's compliance with City's designs (which shall not include City-approved Contractor's designs or CBTC System Performance Requirements stated in this Agreement); (2) City's use or combination of the CBTC System with products or data of the type for which the CBTC System was neither designed nor intended (which exclusion of obligation shall not include integration of the CBTC System with the SFMTA's Third-Party Systems identified in Contract Specifications, Section 28.3 (CBTC External Interfaces) ; or (3) the modification of the CBTC System in a manner not permitted under this Agreement or (where the Agreement is silent) without Contractor's prior written consent.

ARTICLE 7 LIABILITY OF THE PARTIES

7.1. City's Liability. City's payment obligations under this Agreement shall be limited to the payment of the compensation provided for in Article 4 of this Agreement. Notwithstanding any other provision of this Agreement, in no event shall City be liable, regardless of whether any claim is based on contract or tort, for any special, consequential, indirect or incidental damages, including, but not limited to, lost profits, arising out of or in connection with this Agreement or the Contractor's performance of the Services.

7.2. Contractor's Liability. Contractor's aggregate liability to the City is limited to the following: (a) during the Procurement Term, the total System Procurement Price in Table 1 of Appendix B1; and (b) during the Support Term, the total of sixty times the Adjusted Monthly Support Fee in Row 1, Column B of Table 3 of Appendix B1, as those amounts may be modified by Contract Modifications approved in accordance with Section 12.5 (Contract Modifications and Change Orders) or the City's exercise of Options listed in Table 2 of Appendix B. Said limitations of liability shall not apply to: (1) damages and other liability caused by Contractor's willful, intentional acts or omissions; (2) liability arising under or for violation of any applicable statute, City ordinance, regulation, or other laws; (3) damages and other liability arising under claims by third parties in accordance with Section 6.2. Indemnification; and (4) damages and other liability for infringement of any intellectual property right.

For greater certainty, the limitations of liability under this Section 7.2 shall not affect Contractor's obligations to maintain in full force and effect the insurance with the minimum coverages as detailed in Section 6.1., Insurance.

7.3. Limitations on Liability for Incidental and Consequential Damages and for Damages Related to Non-Vital Functions. Except for liquidated damages, Contractor shall not be responsible for indirect, incidental and consequential damages resulting from Contractor's acts or omissions, including, but not limited to, lost profits and business interruption. Except to the extent caused by Contractor's negligence or fault in the performance of this Agreement, Contractor shall not be responsible for damages related to functions specified as non-vital under Sections 16, 18, and 19 of the Technical Specifications (Appendix A). Nothing in this Agreement shall constitute a waiver or limitation of any rights that City may have under applicable law.

7.4. Joint and Several Liability. If Contractor is a joint venture partnership, the liability of each partner of the joint venture under this Agreement, including the obligations and requirements of this Article, shall be joint and several. No provision of any joint venture or similar agreement shall limit or amend this requirement.

7.5. Liability for Use of Equipment. City shall not be responsible for any damage to persons or property as a result of the use, misuse or failure of any equipment or tools provided by and used by Contractor, or by any of its employees, for the purposes of performing any Work hereunder.

7.6. Liability for Reference Materials. Contractor acknowledges that the City has provided Contractor with the documents and other written descriptions, drawings, and other materials listed in Appendix L (Reference Materials) to this Agreement, which is information that the City has provided Contractor concerning existing City infrastructure, SFMTA systems, SFMTA transit operations, and other relevant information that Contractor may find useful in order to plan, design, implement and otherwise perform the Services. The City has provided the Reference Materials to Contractor as background and context to the Project only. The City does not warrant or in any way represent that the Reference Materials are complete or fully accurate. Contractor shall confirm all information and materials on which is relies to plan, design and implement the CBTC System. The City shall not be liable for Contractor's use or reliance on the Reference Materials. Contractor shall independently confirm the completeness and accuracy of any information that the Reference Materials contain.

ARTICLE 8 PAYMENT OF TAXES

8.1. Contractor to Pay All Taxes. Except for any applicable California sales and use taxes charged by Contractor to City, Contractor shall pay all taxes, including possessory interest taxes levied upon or as a result of this Agreement or the Services delivered pursuant hereto. Contractor shall remit to the State of California any sales or use taxes paid by City to Contractor under this Agreement. Contractor agrees to promptly provide information requested by the City to verify Contractor's compliance with any State requirements for reporting sales and use tax paid by City under this Agreement.

8.2. Possessory Interest Taxes. Contractor acknowledges that this Agreement may create a "possessory interest" for property tax purposes. Generally, such a possessory interest is not created unless the Agreement entitles Contractor to possession, occupancy, or use of City property for private gain. If such a possessory interest is created, then the following shall apply:

8.2.1. Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that Contractor, and any permitted successors and assigns, may be subject to real property tax assessments on the possessory interest.

8.2.2. Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that the creation, extension, renewal, or assignment of this Agreement may result in a "change in ownership" for purposes of real property taxes, and therefore may result in a revaluation of any possessory interest created by this Agreement. Contractor accordingly agrees on behalf of itself and its permitted successors and assigns to report on behalf of the City to the County Assessor the information required by Revenue and Taxation Code Section 480.5, as amended from time to time, and any successor provision.

8.2.3. Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that other events also may cause a change of ownership of the possessory interest and result in the revaluation of the possessory interest. (see, e.g., Rev. & Tax. Code Section 64, as amended from time to time). Contractor accordingly agrees on behalf of

itself and its permitted successors and assigns to report any change in ownership to the County Assessor, the State Board of Equalization or other public agency as required by law.

8.2.4. Contractor further agrees to provide such other information as may be requested by the City to enable the City to comply with any reporting requirements for possessory interests that are imposed by applicable law.

8.3. Withholding. Contractor agrees that it is obligated to pay all amounts due to the City under the San Francisco Business and Tax Regulations Code (SFBTRC) during the Contract Term. Pursuant to SFBTRC Section 6.10-2, Contractor further acknowledges and agrees that City may withhold any payments due to Contractor under this Agreement if Contractor is delinquent in the payment of any amount required to be paid to the City under the SFBTRC. Any payments withheld under this paragraph shall be released to Contractor, without interest, upon Contractor curing its noncompliance with the SFBTRC requirements.

ARTICLE 9 TERMINATION AND DEFAULT

9.1. Termination for Convenience

9.1.1. Exercise of Option. City may, in its sole discretion, terminate this Agreement, at any time during the term hereof, for convenience and without cause. City shall exercise this Option by giving Contractor written notice of termination. The notice shall specify the date on which termination shall become effective.

9.1.2. Contractor Actions. Upon receipt of the notice of termination, Contractor shall commence and perform, with diligence, all actions necessary on the part of Contractor to effect the termination of this Agreement on the date specified by City and to minimize the liability of Contractor and City to third parties as a result of the termination. All such actions shall be subject to the prior approval of City. Such actions may include any or all of the following, without limitation:

(a) Halting the performance of all Services under this Agreement on the date(s) and in the manner specified by the SFMTA.

(b) Terminating all existing orders and subcontracts, and not placing any further orders or subcontracts for Materials, Services, Equipment or other items.

(c) At the SFMTA's direction, assigning to City any or all of Contractor's right, title, and interest under the orders and subcontracts terminated. Upon such assignment, the SFMTA shall have the right, in its sole discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.

(d) Subject to the SFMTA's approval, settling all outstanding liabilities and all claims arising out of the termination of orders and subcontracts.

(e) Completing performance of any Services that the SFMTA designates to be completed prior to the date of termination specified by the SFMTA.

(f) Taking such action as may be necessary, or as the SFMTA may direct, for the protection and preservation of any property related to this Agreement which is in the possession of Contractor and in which the SFMTA has or may acquire an interest.

(g) Delivering Materials, design documents, warranties, third-party Software and end-user licenses, CBTC System documentation, and Equipment to the SFMTA, and the SFMTA arranging to accept title to such items for which the City has compensated Contractor, or, at SFMTA's request, purchasing all or the portion of such items for which the SFMTA has not compensated Contractor as stated in Appendix B (Schedule of Prices and Calculation of Charges) or (if not price is stated) in accordance with the pricing requirements of Section 9.1.3 (Contractor Invoice). These provisions cover all warranty and maintenance spare parts, tools and equipment which may be stored by Contractor. The Contractor shall not sell, retain or dispose of all or a portion of any such items subsequent to receiving a notice of termination without the SFMTA's written directive and authorization.

(h) Providing complete documentation for all Materials delivered to SFMTA under this Agreement. The Contractor shall transfer all necessary licenses and warranties for the Materials and Software provided to SFMTA.

9.1.3. Contractor Invoice. Within 30 Days after the specified termination date, Contractor shall submit to the SFMTA an invoice, which shall set forth each of the following as a separate line item:

(a) The reasonable cost to Contractor, without profit, for all Work performed prior to the specified termination date, for which Work the SFMTA has not already tendered payment. Reasonable costs may include a reasonable allowance for actual overhead, not to exceed a total of 10% of Contractor's direct costs for said Work. Any overhead allowance shall be separately itemized. Contractor may also recover the reasonable cost of preparing the invoice.

(b) A reasonable allowance for profit on the cost of the Work described in the immediately preceding subsection (a), provided that Contractor can establish, to the satisfaction of the SFMTA, that Contractor would have made a profit had all Work under this Agreement been completed, and provided further, that the profit allowed shall in no event exceed 5% of such cost.

(c) The reasonable cost to Contractor of handling Materials returned to the vendor, delivered to the SFMTA or otherwise disposed of as directed by the SFMTA.

(d) A deduction for the cost of Materials which Contractor will retain and for which Contractor has been paid, amounts realized from the sale of Materials and not otherwise recovered by or credited to the SFMTA, and any other appropriate credits to the SFMTA against the cost of said Materials or other elements of the Work.

(e) The reasonable cost of the portion of the Materials Contractor for which the SFMTA has not paid Contractor, but that the SFMTA wants to acquire.

9.1.4. Nonrecoverable Costs. In no event shall the City be liable for costs incurred by Contractor (or any of its Affiliates, subcontractors or suppliers) after the termination date specified by the SFMTA, except for those costs specifically listed in Section 9.1.3 (Contractor Invoice). Such non-recoverable costs include, but are not limited to, anticipated profits on the Services under this Agreement, post-termination employee salaries, post-termination administrative expenses, post-termination overhead or unabsorbed overhead, attorneys' fees or other costs relating to a claim or lawsuit, prejudgment interest, or any other expense which is not reasonable or authorized under Section 9.1.3.

9.1.5. Deductions. In arriving at the amount due to Contractor under this Section, the SFMTA may deduct: (i) all payments previously made by the SFMTA for Services covered by Contractor’s final invoice; (ii) any claim which the SFMTA may have against Contractor in connection with this Agreement; (iii) any invoiced costs or expenses excluded pursuant to the immediately preceding Section 9.1.4 (Nonrecoverable Costs); and (iv) in instances in which, in the opinion of the SFMTA, the cost of any portion of the Work performed under this Agreement is excessively high due to costs incurred to remedy or replace defective or rejected Services, the difference between the invoiced amount and the SFMTA’s estimate of the reasonable cost of performing the invoiced Work in compliance with the requirements of this Agreement.

9.1.6. Payment Obligation. The City’s payment obligation under this Section shall survive termination of this Agreement.

9.2. Termination for Default; Remedies

9.2.1. Event of Default. Each of the following shall constitute an immediate event of default (Event of Default) under this Agreement:

(a) Contractor fails or refuses to perform or observe any term, covenant or condition contained in any of the following Sections of this Agreement:

- 4.7 Submitting False Claims
- 5.12 Assignment
- 5.19 Bond Requirements
- Article 6 Insurance and Indemnity
- Article 8 Payment of Taxes
- 11.9 Alcohol and Drug-Free Workplace
- 12.12 Compliance with Laws
- Article 13 Data and Security

(b) Contractor fails or refuses to perform or observe any other term, covenant or condition contained in this Agreement, including any obligation imposed by ordinance or statute and incorporated by reference herein, and such default is not cured within 30 days after written notice thereof from the SFMTA to Contractor. If Contractor defaults a second time in the same manner as a prior default cured by Contractor, the SFMTA may in its sole discretion immediately terminate the Agreement for default or grant an additional period not to exceed 30 days for Contractor to cure the default.

(c) Contractor (i) is generally not paying its debts as they become due; (ii) files, or consents by answer or otherwise to the filing against it of a petition for relief or reorganization or arrangement or any other petition in bankruptcy or for liquidation or to take advantage of any bankruptcy, insolvency or other debtors’ relief law of any jurisdiction; (iii) makes an assignment for the benefit of its creditors; (iv) consents to the appointment of a custodian, receiver, trustee or other officer with similar powers of Contractor or of any substantial part of Contractor’s property; or (v) takes action for the purpose of any of the foregoing.

(d) A court or government authority enters an order (i) appointing a custodian, receiver, trustee or other officer with similar powers with respect to Contractor or with respect to any substantial part of Contractor’s property, (ii) constituting an order for relief or

approving a petition for relief or reorganization or arrangement or any other petition in bankruptcy or for liquidation or to take advantage of any bankruptcy, insolvency or other debtors' relief law of any jurisdiction or (iii) ordering the dissolution, winding-up or liquidation of Contractor.

9.2.2. City's Remedies. On and after any Event of Default, City shall have the right to exercise its legal and equitable remedies, including, without limitation, the right to: terminate this Agreement; seek specific performance from the Contractor of all or any part of this Agreement; and exercise its rights pursuant to the Performance Bond and Guaranty. In addition, where applicable, City shall have the right (but no obligation) to cure (or cause to be cured) on behalf of Contractor any Event of Default after providing Surety and Contractor written notice and an opportunity to cure; if City proceeds after such reasonable notice to Surety and Contractor, it must mitigate costs and expenses as part of such cure. Contractor and its surety (sureties) and Guarantor(s) shall pay to City all reasonable and documented costs and expenses incurred by City in effecting such cure. City shall have the right to offset from any amounts due to Contractor under this Agreement: (i) all damages, losses, costs or expenses incurred by City as a result of an Event of Default; and (ii) any liquidated damages levied upon Contractor pursuant to the terms of this Agreement; and (iii), any damages imposed by any ordinance or statute that is incorporated into this Agreement by reference. This Section 9.2.2 (Remedies) shall survive termination of this Agreement. The SFMTA may withhold all or any portion of further payments to Contractor until such time that the SFMTA can determine the remaining amount owed to Contractor. The City's termination of this Agreement for Contractor's default shall not void, terminate or otherwise compromise the City's perpetual rights under the Software License. (See Section 10.3 and Appendix K.)

9.2.3. Remedies Are Not Exclusive. Except as expressly stated in this Agreement, all remedies provided for in this Agreement may be exercised individually or in combination with any other remedy available hereunder or under applicable laws, rules and regulations. The exercise of any remedy shall not preclude or in any way be deemed to waive any other remedy. Nothing in this Agreement shall constitute a waiver or limitation of any rights that City may have under applicable law.

9.2.4. Adverse Court Decision. If a court determines that a termination for default is unlawful, the termination shall be deemed a termination for convenience.

9.2.5. Notice of Default. Any notice of default must be sent to the address set forth in Section 12.1 (Notices to the Parties).

9.3. No Waiver of Rights. The omission by either Party at any time to enforce any default or right reserved to it, or to require performance of any of the terms, covenants, or provisions hereof by the other Party at the time designated, shall not constitute a waiver of any such default or right to which the Party is entitled, nor shall it in any way affect the right of the Party to enforce such provisions thereafter.

9.4. Rights and Duties upon Termination or Expiration

9.4.1. Survival. This Section 9.4.1 and the following Sections of this Agreement listed below, shall survive termination or expiration of this Agreement:

- 4.5.2 City's Payment Obligations
- 4.5.10 Grant-Funded Contracts

4.6	Audit and Inspection of Records
4.7	Submitting False Claims
5.11	Independent Contractor; Payment of Employment Taxes and Other Expenses
Article 6	Insurance and Indemnity
Article 7	Liability of the Parties
Article 8	Payment of Taxes
9.1.6	Payment Obligation
9.3	No Waiver of Rights
10.1	Ownership of Results
10.2	Works for Hire
10.3	Software License
12.8	Dispute Resolution Procedures
12.9	Agreement Made in California; Venue
12.10	Construction and Interpretation of Contract Documents
12.11	Entire Agreement
12.12	Compliance with Laws
12.13	Severability
Article 13	Data and Security

9.4.2. Contractor Duties. Subject to the survival of the Sections identified in Section 9.4.1 (Survival) above, if this Agreement is terminated prior to expiration of the Contract Term specified in Article 3 (Contract Term), this Agreement shall be of no further force or effect. Contractor shall transfer title to City, and deliver in the manner, at the times, and to the extent, if any, directed by City, any Work in progress, completed Work, supplies, equipment, Materials and other items procured, acquired or produced as a part of or in connection with the performance of this Agreement, and any completed or partially completed Work which, if this Agreement had been completed, Contractor would have been required to provide to City.

ARTICLE 10 RIGHTS IN DELIVERABLES; SOFTWARE LICENSE

10.1. Ownership of Results. Any interest of Contractor, its Affiliates or its subcontractors in the Deliverables, including any drawings, plans, specifications, blueprints, studies, reports, memoranda, computation sheets, computer files and media or other documents created or prepared by Contractor, its Affiliates, or its subcontractors for the purposes of this Agreement and solely for the use of the SFMTA, shall become the property of and will be transmitted to City, except for Contractor’s Technology, which is defined as any Deliverables, technology or intellectual property of Contractor, its Affiliates or Subcontractors that were developed before or separately from the Agreement. The City shall be granted a non-exclusive perpetual license to use Contractor’s Technology included in Deliverables pursuant to 10.1.1. However, unless expressly prohibited elsewhere in this Agreement, Contractor shall be granted a perpetual license to use said Deliverables for which it does not retain ownership, including the right to retain and use copies for reference and as documentation of its experience and capabilities. The Deliverables that are City property under this Section 10.1 do not include Software, systems operations and maintenance manuals or other materials described in Section 10.3 (Software License), which Contractor shall license to the City for its use as provided in the Software License. City Data is the property of the City. Contractor may access and utilize City Data only to the extent necessary to implement, operate and maintain the System. In the event of

uncertainty with respect to the ownership of any Deliverable, the Parties agree to discuss in good faith to determine the corresponding ownership.

10.1.1. General License to the SFMTA. For Deliverables containing Contractor's Technology, Contractor grants an irrevocable, perpetual license to use the Deliverables provided to the SFMTA for the purposes of the operation and maintenance of the System. The physical copies of all Deliverables shall become the property of the City.

10.2. Works for Hire. If, in the performance of the Services, Contractor, its Affiliates, or its subcontractors creates Deliverables solely for use of the City pursuant to this Agreement, namely artwork, copy, posters, billboards, photographs, videotapes, audiotapes, reports, diagrams, surveys, blueprints, or any other original works of authorship, whether in digital or any other format, except for Contractor's Technology, such works of authorship shall be works for hire as defined under Title 17 of the United States Code, and all copyrights in such works shall be the property of the City. If any Deliverables created by Contractor, its Affiliate(s), or its subcontractor(s) solely for use of the City under this Agreement are ever determined not to be works for hire under U.S. law, Contractor hereby assigns all Contractor's copyrights to such Deliverables to the City, agrees to provide any material and execute any documents necessary to effectuate such assignment, and agrees to include a clause in every subcontract imposing the same duties upon subcontractor(s). For greater certainty, delivery of Contractor's Technology will not result in the transfer of ownership in any of the concerned Deliverables. With City's prior written approval, Contractor, its Affiliate(s), and its subcontractor(s) may retain and use copies of such works for reference and as documentation of their respective experience and capabilities. If any of the foregoing Deliverables are Contractor's Technology or Contractor's Proprietary Information, the City shall have a perpetual, unlimited license to use said Contractor's Technology or Proprietary Information for the operation and maintenance of the System. Contractor's Technology and Materials described in Section 10.3 (Software License), including Software, source code, and operations and maintenance manuals are not Works for Hire as described in this Section 10.2.

10.3. Software License

10.3.1. As more specifically provided in the Software License in Appendix K (CBTC Software License Agreement), Contractor grants to the City a non-exclusive, non-transferable, perpetual license to use the Software purchased under this Agreement, including all Software procured by Contractor and provided to City from third parties, from the date of full payment for the Software. The license for the Software shall be limited to the SFMTA's use for its operation and maintenance of the CBTC System. The City has no right to grant sublicenses. Contractor warrants that it has the title to and/or authority to grant said license(s) and sublicenses(s) to the City. The City receives no title or ownership rights to Software purchased under this Agreement, and all such rights shall remain with Contractor or its suppliers.

10.3.2. The City agrees that the Software provided to it by Contractor under this Agreement, and any Enhancements, Updates, Upgrades, renewals, extensions, or expansions of the Software, shall, as between the Parties, be treated as proprietary and a trade secret of Contractor or its suppliers and be subject to the provisions of Section 13.1 (Nondisclosure of Proprietary, Private, or Confidential Information).

10.3.3. The Software provided under this Agreement may contain software obtained by Contractor from a third-party source. Any license fee that Contractor has paid for the

inclusion of any such third-party software in the System is included in the compensation paid by City to Contractor under this Agreement for the Contract Term only. After the Contract Term, any third party licenses and fees shall be the responsibility of the City. Any such third-party software is also included in Contractor's warranties and support Services under this Agreement. Contractor agrees to place all such third-party warranties and service agreements in the City's name as the software and system owner or authorized end-user. The City agrees to abide by the relevant terms and conditions or End User License Agreements ("EULA's") of any third-party software. City and Contractor acknowledge and agree that as part of the Warranty and/or Support services provided by Contractor in this Agreement, Contractor will manage all third-party warranties on City's behalf and the City shall resolve all issues with the third-party software directly with Contractor. The City will only directly purchase third-party software that is identified in Appendix A (Contract Specifications) Section 9.3 (Permanent SFMTA Furnished Items). For directly purchased software, the City will manage the third-party warranties and resolve all issues with the third-party software directly with the third-party software provider.

10.3.4. This Section 10.3 and Appendix K (CBTC Software License Agreement) shall survive expiration or termination of this Agreement.

ARTICLE 11 ADDITIONAL REQUIREMENTS INCORPORATED BY REFERENCE

11.1. Laws Incorporated by Reference. The full text of the laws listed in this Article 11 (Additional Requirements Incorporated by Reference), including enforcement and penalty provisions, are incorporated by reference into this Agreement. The full text of the San Francisco Municipal Code provisions incorporated by reference in this Article and elsewhere in the Agreement (Mandatory City Requirements) are available at http://www.amlegal.com/codes/client/san-francisco_ca.

11.2. Conflict of Interest. By executing this Agreement, Contractor certifies that it does not know of any fact which constitutes a violation of Section 15.103 of the City's Charter; Article III, Chapter 2 of City's Campaign and Governmental Conduct Code; Title 9, Chapter 7 of the California Government Code (Section 87100 et seq.), or Title 1, Division 4, Chapter 1, Article 4 of the California Government Code (Section 1090 et seq.), and further agrees promptly to notify the City if it becomes aware of any such fact during the Contract Term.

11.3. Prohibition on Use of Public Funds for Political Activity. In performing the Services, Contractor shall comply with San Francisco Administrative Code Chapter 12G, which prohibits funds appropriated by the City for this Agreement from being expended to participate in, support, or attempt to influence any political campaign for a candidate or for a ballot measure. Contractor is subject to the enforcement and penalty provisions in Chapter 12G.

11.4. Consideration of Salary History. Contractor shall comply with San Francisco Administrative Code Chapter 12K, the Consideration of Salary History Ordinance or "Pay Parity Act." Contractor is prohibited from considering current or past salary of an applicant in determining whether to hire the applicant or what salary to offer the applicant to the extent that such applicant is applying for employment to be performed on this Agreement or in furtherance of this Agreement, and whose application, in whole or part, will be solicited, received, processed or considered, whether or not through an interview, in the City or on City property. The ordinance also prohibits employers from (a) asking such applicants about their current or past salary or (b) disclosing a current or former employee's salary history without that employee's

authorization unless the salary history is publicly available. Contractor is subject to the enforcement and penalty provisions in Chapter 12K. Information about and the text of Chapter 12K is available on the web at <https://sfgov.org/olse/consideration-salary-history>. Contractor is required to comply with all of the applicable provisions of 12K, irrespective of the listing of obligations in this Section.

11.5. Nondiscrimination Requirements

11.5.1. Nondiscrimination in Contracts. Contractor shall comply with the provisions of Chapters 12B and 12C of the San Francisco Administrative Code. Contractor shall incorporate by reference in all subcontracts the provisions of Sections 12B.2(a), 12B.2(c)-(k), and 12C.3 of the San Francisco Administrative Code and shall require all Affiliates and Subcontractors to comply with such provisions. Contractor is subject to the enforcement and penalty provisions in Chapters 12B and 12C.

11.5.2. Nondiscrimination in the Provision of Employee Benefits. Contractor shall comply with San Francisco Administrative Code 12B.2. Contractor shall not as of the date of this Agreement, and will not during the Contract Term, in any of its operations in San Francisco, on real property owned by San Francisco, or where work is being performed for the City elsewhere in the United States, discriminate in the provision of employee benefits between employees with domestic partners and employees with spouses and/or between the domestic partners and spouses of such employees, subject to the conditions set forth in San Francisco Administrative Code Section 12B.2.

11.6. Small Business Enterprise Program

11.6.1. General. The SFMTA is committed to a Small Business Enterprise Program (SBE Program) for the participation of SBEs in contracting opportunities. In addition, Contractor must comply with all applicable federal regulations regarding Small Business Enterprise (SBE) participation, as set out in Title 49, Part 26 of the Code of Federal Regulations, with respect to SBEs performing Work under this Agreement. More information on federal SBE requirements can be found on the internet at: <http://www.fta.dot.gov/civilrights/12326.html>.

11.6.2. Compliance with SBE Program. Contractor shall comply with the SBE provisions contained in Appendix H attached to this Agreement and incorporated by reference as though fully set forth, including, but not limited to, achieving and maintaining the SBE goal set for the total dollar amount Awarded for the services to be performed under this Agreement. Failure of Contractor to comply with any of these requirements shall be deemed a material breach of this Agreement.

11.6.3. Nondiscrimination in Hiring. Pursuant to City and SFMTA policy, Contractor is encouraged to recruit actively minorities and women for its workforce and take other steps within the law, such as on-the-job training and education, to ensure non-discrimination in Contractor's employment practices.

11.7. Minimum Compensation Ordinance. The City urges Contractor to pay employees performing the Services no less than the minimum compensation required by San Francisco Administrative Code Chapter 12P, including a minimum hourly gross compensation, compensated time off, and uncompensated time off. Information about and the text of the Chapter 12P is available on the web at <http://sfgov.org/olse/mco>.

11.8. First Source Hiring Program. Contractor must comply with all of the provisions of the First Source Hiring Program, Chapter 83 of the San Francisco Administrative Code, that apply to this Agreement, and Contractor is subject to the enforcement and penalty provisions in Chapter 83.

11.9. Alcohol and Drug-Free Workplace. City reserves the right to deny access to or to require Contractor to remove from City facilities personnel of any Contractor, Affiliate, or Subcontractor who City has reasonable grounds to believe has engaged in alcohol abuse or illegal drug activity which in any way impairs City's ability to maintain safe work facilities or to protect the health and well-being of City employees and the general public. City shall have the right of final approval for the entry or re-entry of any such person previously denied access to, or removed from, City facilities. Illegal drug activity means possessing, furnishing, selling, offering, purchasing, using or being under the influence of illegal drugs or other controlled substances for which the individual lacks a valid prescription. Alcohol abuse means possessing, furnishing, selling, offering, or using alcoholic beverages, or being under the influence of alcohol.

Contractor agrees in the performance of this Agreement to maintain a drug-free workplace by notifying employees that unlawful drug use is prohibited and specifying what actions will be taken against employees for violations; establishing an on-going drug-free awareness program that includes employee notification and, as appropriate, rehabilitation. Contractor can comply with this requirement by implementing a drug-free workplace program that complies with the Federal Drug-Free Workplace Act of 1988 (41 U.S.C. § 701).

11.10. Limitations on Contributions. By executing this Agreement, Contractor acknowledges its obligations under Section 1.126 of the City's Campaign and Governmental Conduct Code, which prohibits any person who contracts with, or is seeking a contract with, any department of the City for the rendition of personal services, for the furnishing of any material, supplies or equipment, for the sale or lease of any land or building, for a grant, loan or loan guarantee, or for a development agreement, from making any campaign contribution to (a) a City elected official if the contract must be approved by that official, a board on which that official serves, or the board of a state agency on which an appointee of that official serves, (b) a candidate for that City elective office, or (c) a committee controlled by such elected official or a candidate for that office, at any time from the submission of a Proposal for the contract until the later of either the termination of negotiations for such contract or twelve months after the date the City approves the contract. The prohibition on contributions applies to each prospective party to the contract; each member of Contractor's board of directors; Contractor's chairperson, chief executive officer, chief financial officer and chief operating officer; any person with an ownership interest of more than 10% in Contractor; any Affiliate or Subcontractor listed in the bid or contract; and any committee that is sponsored or controlled by Contractor. Contractor certifies that it has informed each such person of the limitation on contributions imposed by Section 1.126 by the time it submitted a Proposal for the contract and has provided the names of the persons required to be informed to the City department with whom it is contracting.

11.11. Consideration of Criminal History in Hiring and Employment Decisions. City urges Contractor to comply with the provisions of Chapter 12T (City Contractor/Subcontractor Consideration of Criminal History in Hiring and Employment Decisions) of the San Francisco Administrative Code (Chapter 12T), including the remedies provided, and implementing regulations, as may be amended from time to time. The provisions

of Chapter 12T are incorporated by reference and made a part of this Agreement as though fully set forth herein. The text of the Chapter 12T is available on the web at <http://sfgov.org/olse/fco>. Contractor is required to comply with all of the applicable provisions of 12T, irrespective of the listing of obligations in this Section. Capitalized terms used in this Section and not defined in this Agreement shall have the meanings assigned to such terms in Chapter 12T.

The requirements of Chapter 12T shall only apply to: (1) Contractor's, Affiliates', or Subcontractors' operations to the extent those operations are in furtherance of the performance of this Agreement; (2) applicants and employees who would be or are performing Work in furtherance of this Agreement; and (3) shall apply when the physical location of the employment or prospective employment of an individual is wholly or substantially within San Francisco. Chapter 12T shall not apply when the application in a particular context would conflict with federal or state law or with a requirement of a government agency implementing federal or state law.

11.12. Food Service Waste Reduction Requirements. City urges Contractor to comply with the Food Service Waste Reduction Ordinance, as set forth in San Francisco Environment Code Chapter 16, including but not limited to the remedies for noncompliance provided therein.

11.13. Tropical Hardwood and Virgin Redwood Ban. The City urges Contractor not to import, purchase, obtain, or use for any purpose, any tropical hardwood, tropical hardwood wood product, virgin redwood or virgin redwood wood product, in accordance with San Francisco Environment Code Section 804(b).

ARTICLE 12 GENERAL REQUIREMENTS

12.1. Notices to the Parties. Unless otherwise indicated in this Agreement, all written communications sent by the Parties may be sent by U.S. mail or e-mail, and shall be addressed as follows:

To City: San Francisco Municipal Transportation Agency
1455 Market Street, 7th floor
San Francisco, CA 94103
Attn: Dan Howard
dan.howard@sfmta.com

To Contractor: Hitachi Rail GTS USA Inc.
99 Park Avenue, Suite 1120
New York, NY 10016
Attn: Ghislain Le Dantec
Ghislain.Ledantec@urbanandmainlines.com

All notices between the parties required by this Agreement or by law, and any communications concerning breach, default, or other communication concerning failure to comply with a material requirement of the Agreement shall also be sent to:

To City: San Francisco Municipal Transportation Agency
Muni Metro East Facility
601 25th Street,
San Francisco, CA 94107
Attn: Janet Gallegos
janet.gallegos@sfmta.com

and Director of Transit
San Francisco Municipal Transportation Agency
1 South Van Ness, 7th floor
San Francisco, CA 94103

To Contractor: Riad Rizk
President and CEO
Hitachi Rail GTS USA Inc.
99 Park Avenue, Suite 1120
New York, NY 10016
ziad.rizk@urbanandmainlines.com

Jason Hannibal
VP Legal & Contracts
Hitachi Rail GTS USA Inc.
99 Park Ave. Suite 1120
New York, NY, 10016
Jason.hannibal@urbanandmainlines.com

Gerard Budzynski
Director, Contracts
Hitachi Rail GTS USA Inc.
99 Park Ave. Suite 1120
New York, NY, 10016
gerard.budzynski@urbanandmainlines.com

Any notice of default or breach of contract must be sent by US Mail first class with email confirmation, or by overnight delivery service or courier, with a signature obtained at delivery. Either Party may change the address to which notice is to be sent by giving written notice thereof to the other Party. If email notification is used, the sender must specify a receipt notice.

12.2. Compliance with Americans with Disabilities Act. Contractor shall provide the Services in a manner that complies with the Americans with Disabilities Act (ADA), including but not limited to Title II program access requirements, and all other applicable federal, state and local disability rights legislation.

12.3. Incorporation of Recitals. The Recitals stated at the beginning of these General Provisions are incorporated into and made part of the Agreement.

12.4. Sunshine Ordinance. Contractor acknowledges that this Agreement and all records related to its formation, Contractor's performance of Services, and City's payment are subject to the California Public Records Act, (California Government Code §6250 et. Seq.), and the San Francisco Sunshine Ordinance, (San Francisco Administrative Code Chapter 67). Such records are subject to public inspection and copying unless exempt from disclosure under federal, California or local law.

12.5. Contract Modifications and Change Orders

12.5.1. Contract Modifications. Either the SFMTA or the Contractor can request a Contract Modification to change the Work within the general scope of the Contract in a way that requires an increase in the Contract Amount and/or an extension of the Contract Term. Appendix E, Contract Changes, establishes the procedure to be followed by the Parties to request to modify the Contract. This Agreement may not be modified, nor may compliance with any of its terms be waived (except as noted in Section 12.1 (Notices to the Parties) regarding change in contract personnel or place of notice) unless such Contract Modification be effected by written instrument executed and approved in accordance with Appendix E, and as required by this Agreement, City law, and the policies of the SFMTA Board of Directors.

12.5.2. Change Orders . The SFMTA shall have the authority, without the execution of a formal Contract Modification, to issue Change Orders to modify the Work within the general scope of the Contract, provided that such Change Orders do not require or involve an increase in the Contract Amount or extension of the Contract Term. Contractor shall not proceed with any Work contemplated in any Change Order until it receives written notification to commence such Work from SFMTA. All Change Orders must be approved by the SFMTA's Project Manager in a reasonable written determination. If Contractor asserts that the proposed Change Order does require an increase in the Contract Amount and/or an extension of the Contract Term, the Contractor is required to submit a Request for Contract Change in accordance with Appendix E. All Change Orders will be incorporated to the Agreement, after written execution by the Parties, and will be memorialized in the next Contract Modification.

12.5.3. Procedures. All Contract Modifications and Change Orders are subject to the approval procedures and requirements set out in this Section 12.5 and Appendix E (Contract Changes).

12.5.4. CCO Approval. Contractor shall cooperate with the SFMTA to submit to the CCO for approval any Contract Modification that would result in a cumulative increase of the original Contract Amount by more than 20 percent.

12.6. Contract Claim Requirements. The requirements that must be met before the Contractor can submit a claim to the SFMTA are set out in Appendix E (Contract Changes). After meeting those requirements, Contractor shall not be entitled to additional compensation or change in Contract Time unless Contractor has submitted a written claim to the SFMTA Project Manager within 30 days of the completion of the procedures of Appendix E. Contractor must provide supporting documentation and reference to applicable Contract provisions in its claim. Contractor's failure to submit a written claim as required in this Agreement may be treated as a waiver of the claim, and shall render void any subsequent claim under Government Code section 900, et seq.

12.7. Authority of Project Manager. The SFMTA Project Manager shall prepare a reasonable and timely determination in writing of all issues and disputes that arise under the Contract. For claims, this determination shall be issued no more than 30 days from the date of the corresponding notification from the Contractor. Contractor may appeal the Project Manager's decision to the Director of Transit, following Section 12.8 (Dispute Resolution Procedures), below.

12.8. Dispute Resolution Procedures

12.8.1. Negotiation; Determination. The Parties will attempt in good faith to negotiate resolution of any dispute relating to this Agreement. Disputes that are not resolved by negotiation shall be decided in writing by the SFMTA Project Manager. See Section 12.7 (Authority of Contract Manager). The Project Manager's decision shall be final, unless within ten Days from the date of such decision, Contractor submits a written appeal of the decision with supporting documentation to the Director of Transit or his/her designee. After the appeal is submitted and before the Director of Transit issues a written decision, either Party may require, by written notice to the other, that a mutually acceptable third-party mediator be selected for the purpose of facilitating a negotiated resolution of the dispute. The Parties will share the costs of the mediation equally. If the mediation is unsuccessful, the subsequent decision of the Director of Transit shall be administratively final for the purposes of Section 12.8.5, Government Code Claim Requirement.

12.8.2. No Slowing or Suspension of Work. The status of any dispute notwithstanding, Contractor shall not suspend or slow its performance of the Work pending resolution of any dispute, and Contractor shall proceed diligently with the performance of its obligations under this Agreement in accordance with the requirements stated in this Agreement and the written directions of the City except as indicated in Section 4.5.6.1 Payment Terms and in Appendix E, Section 7.2, Unilateral Contract Modification. Whenever a payment amount is in dispute, the City shall pay the amount not in dispute subject to all other applicable provisions, requirements and limitations set forth in this Agreement.

12.8.3. Alternative Dispute Resolution. If the Parties agree in writing, a dispute may be resolved by an agreed alternative dispute resolution process.

12.8.4. Prevailing Party Does Not Recover Fees or Costs. Neither Party shall recover from the other Party its administrative costs, attorneys' fees, expert costs, or other costs incurred in the course of negotiating, mediating or litigating any dispute arising from or related to this Agreement; each Party shall bear its own fees and costs, and any rule or practice awarding a prevailing party its fees and costs shall not apply to this Agreement.

12.8.5. Government Code Claim Requirement. No suit for money or damages may be brought against the City until Contractor has exhausted: (a) its contract remedies, provided in Sections 12.6 (Contract Claim Requirements), 12.7 (Authority of Project Manager), and 12.8.1 (Negotiation; Determination); and (b) its administrative remedies by submitting a written claim to the City in accordance with the provisions of San Francisco Administrative Code Chapter 10 and California Government Code Section 900, et seq. Nothing stated in this Agreement shall operate to toll, waive or excuse Contractor's compliance with the California Government Code Claim requirements, as set forth in San Francisco Administrative Code Chapter 10 and California Government Code Section 900, et seq.

12.9. Agreement Made in California; Venue. This Agreement was advertised, negotiated, executed, and shall be performed in San Francisco, California. The City and County of San Francisco is a municipal corporation established under the constitution and laws of the State of California, which shall govern the formation, interpretation and performance of this Agreement. Venue for all litigation concerning this Agreement shall be in San Francisco, California, and Contractor waives all arguments contesting San Francisco as appropriate venue.

12.10. Construction and Interpretation of Contract Documents

12.10.1. Cooperative Drafting. This Agreement has been negotiated and drafted through a cooperative effort of City and Contractor, and both Parties have had an opportunity to have the Agreement reviewed and revised by legal counsel. No Party shall be considered the drafter of this Agreement, and no presumption or rule that an ambiguity shall be construed against the Party drafting of this Agreement or any part of it shall apply to the interpretation or enforcement of this Agreement or any part of it.

12.10.2. Contractor's Scope of Work. In case of any ambiguity in the Agreement, the Agreement shall be interpreted and constructed so that Contractor is the party responsible and obligated to perform all Work and Incidental Work, to provide all Services, and furnish all Equipment, Software, Deliverables, Submittals, tools and Materials necessary to design, implement, test and certify the CBTC System for Revenue Service in accordance with the Contract Specifications, unless and only to the extent that any provision of the Agreement expressly states that the SFMTA, another SFMTA contractor or another entity is obligated to perform a specific task or service or furnish materials.

12.10.3. Captions and Titles Are for Reference Only. All paragraph captions are for reference only and shall not be considered in construing this Agreement.

12.11. Entire Agreement. This Contract sets forth the entire agreement between the Parties. The Contract Documents constitute an integrated agreement, which supersedes all other oral or written understandings and provisions. All Included Appendices in Article 14 to this Agreement are incorporated by reference as though fully set forth. This Agreement may be modified only as provided in Section 12.5 (Contract Modifications and Change Orders).

12.12. Compliance with Laws. Contractor shall keep itself fully informed of the City's Charter, codes, ordinances and duly adopted rules and regulations of the City and of all state, and federal laws (collectively "Codes") that in any manner affect the Project and the performance of this Agreement, and Contractor shall at all times comply with such Codes as they may be amended from time to time. If any Code changes during the course of the Agreement which impacts the Contractor's delivery of the Works or cost thereof the Parties shall meet and discuss in good faith the possibility of reducing the impact of such change. Any claim for compensation shall be submitted and processed as a Contract Modification issued under Section 12.5.

12.13. Severability. Should the application of any provision of this Agreement to any particular facts or circumstances be found by a court of competent jurisdiction to be invalid or unenforceable, then (a) the validity of other provisions of this Agreement shall not be affected or impaired thereby, and (b) such provision shall be enforced to the maximum extent possible so as to effect the intent of the Parties and shall be reformed without further action by the Parties to the extent necessary to make such provision valid and enforceable.

12.14. Order of Precedence. Contractor agrees to perform the Services in accordance with the terms and conditions of this Agreement and the Contract Specifications. In case of any ambiguity or conflict in Contract requirements, the Contract shall be interpreted using the following order of Precedence:

1. Contract Modifications in inverse chronological order
2. Change Orders approved by the SFMTA in inverse chronological order
3. Contract Specifications (Appendix A to Agreement)

4. General Provisions
5. Included Appendices (other than Appendix A)

12.15. Time is of the Essence. Time is of the essence in Contractor's performance of the Services.

12.16. Federal Requirements. Contractor shall comply with all applicable federal contracting requirements, including but not limited to the Federal Contract Requirements set out in Appendix G to this Agreement, which are incorporated by reference as if fully set out here. If there is any conflict between any federal contracting requirement and any provision of this Agreement, the federal requirement shall prevail. The SFMTA has not adopted the contract requirements of the Federal Acquisition Regulations (FAR). As a department of the City and County of San Francisco, exercising its home rule authority granted by the California constitution, the SFMTA shall not be bound by any provision of the FAR.

12.17. Large Vehicle Driver Safety Training Requirements

12.17.1. Contractor agrees that before any of its employees, Affiliates, and subcontractors drive large vehicles within the City and County of San Francisco, those employees, Affiliates, and subcontractors shall successfully complete either (a) the SFMTA's Large Vehicle Urban Driving Safety training program or (b) a training program that meets the SFMTA's approved standards for large vehicle urban driving safety. The SFMTA's approved standards for large vehicle urban driving safety is available for download at www.SFMTA.com/largevehicletrainingstandards. This requirement does not apply to drivers providing delivery services who are not employees, Affiliates, or subcontractors of Contractor. For purposes of this section, "large vehicle" means any single vehicle or combination of vehicle and trailer with an unladen weight of 10,000 pounds or more, or a van designed to carry 10 or more people.

12.17.2. By entering into this Agreement, Contractor agrees that in the event Contractor fails to comply with the Large Vehicle Driver Safety Training Requirements, the City will suffer actual damages that will be impractical or extremely difficult to determine; further, Contractor agrees that the sum of up to One Thousand Dollars (\$1,000) per employee, Affiliate, or subcontractor who is permitted to drive a large vehicle in violation of these requirements is not a penalty, but is a reasonable estimate of the loss that City will incur based on Contractor's failure to comply with this requirement, established in light of the circumstances existing at the time this Contract was Awarded. City may deduct a sum representing the liquidated damages from any money due to Contractor. Such deductions shall not be considered a penalty, but rather agreed monetary damages sustained by City because of Contractor's failure to comply.

12.18. MacBride Principles – Northern Ireland. The provisions of San Francisco Administrative Code §12F are incorporated herein by this reference and made part of this Agreement. By signing this Agreement, Contractor confirms that Contractor has read and understood that the City urges companies doing business in Northern Ireland to resolve employment inequities and to abide by the MacBride Principles and urges San Francisco companies to do business with corporations that abide by the MacBride Principles.

ARTICLE 13 DATA AND SECURITY

13.1. Nondisclosure of Private, Proprietary, or Confidential Information

13.1.1. Protection of Private Information. If this Agreement requires City to disclose “Private Information” to Contractor within the meaning of San Francisco Administrative Code Chapter 12M, Contractor, Contractor’s Affiliates, and subcontractors shall use such information only in accordance with the restrictions stated in Chapter 12M and in this Agreement and only as necessary in performing the Services. Contractor is subject to the enforcement and penalty provisions in Chapter 12M.

13.1.2. Confidential and Proprietary Information. Contractor understands and agrees that the performance of the Work under this Agreement will involve access to Confidential Information. Contractor and any of its Affiliates, subcontractors or agents shall use Proprietary Information only in accordance with all applicable local, California and federal laws restricting the access, use and disclosure of Confidential Information, and only as necessary in the performance of this Agreement. Contractor shall exercise the same standard of care to protect such information as a reasonably prudent contractor would use to protect its own proprietary or Confidential Information. Contractor’s failure to comply with any requirements of local, California or federal laws restricting access, use and disclosure of Confidential Information shall be deemed a material breach of this Agreement, for which City may terminate the Agreement. In addition to termination or any other remedies set forth in this Agreement or available in equity or law, the City may bring a false claim action against Contractor pursuant to Chapters 6 or 21 of the Administrative Code or debar Contractor. Contractor agrees to include all of the terms and conditions regarding Confidential Information contained in this Agreement in all subcontractor or agency contracts providing services under this Agreement. The City acknowledges that in the course of designing and implementing the CBTC, the City will have access to Proprietary Information.

13.1.3. Obligation of Confidentiality. Subject to San Francisco Administrative Code Section 67.24(e), any applicable open records or freedom of information statutes, and any other applicable laws, Parties agree to hold all Confidential Information and Proprietary Information in strict confidence and not to copy, reproduce, sell, transfer, or otherwise dispose of, give or disclose such Confidential Information or Proprietary Information to third parties other than employees, agents, Affiliates, or authorized subcontractors of a Party who have a need to know in connection with this Agreement, or to use such Confidential Information or Proprietary Information for any purposes whatsoever other than the performance of this Agreement. If a Party determines that an employee, agent, Affiliate, or authorized subcontractor has a need to know in connection with this Agreement, the Party may disclose such Confidential Information or Proprietary Information under an agreement with protections equivalent to the Sensitive Security Information Confidentiality and Nondisclosure Agreement included in the Request for Proposals. The Parties agree to advise and require its respective employees, agents, Affiliates, and subcontractors of their obligations to keep all Confidential Information and Proprietary Information confidential.

13.1.4. Nondisclosure

(a) Contractor agrees and acknowledges that it shall have no proprietary interest in any Confidential Information of the City and will not disclose, communicate or publish the nature or content of such information to any person or entity, nor

use, except in connection with the performance of its obligations under this Agreement or as otherwise authorized in writing by the City, any of the Confidential Information it produces, receives, acquires or obtains from the disclosing Party.

(b) Contractor shall take all necessary steps to ensure that the City's Confidential Information is securely maintained. Contractor's obligations set forth herein shall survive the termination or expiration of this Agreement.

(c) In the event Contractor becomes legally compelled to disclose any City Confidential Information, it shall provide the SFMTA with prompt notice thereof and shall not divulge any information until the SFMTA has had the opportunity to seek a protective order or other appropriate remedy to curtail such disclosure. If such actions by the SFMTA are unsuccessful, or the SFMTA otherwise waives its right to seek such remedies, Contractor shall disclose only that portion of the City's Confidential Information that it is legally required to disclose.

(d) The SFMTA shall take all necessary steps to ensure that Contractor's Proprietary Information is securely maintained. The SFMTA's obligations set forth herein shall survive the termination or expiration of this Agreement.

(e) The SFMTA shall agree not to disclose any Proprietary Information to any third party without the Contractor's prior consent, unless it becomes legally compelled to disclose any Contractor Proprietary Information, in which case it shall provide Contractor with prompt notice thereof and shall not divulge any Proprietary Information until Contractor has had the opportunity to seek a protective order or other appropriate remedy to curtail such disclosure. If such actions by the Contractor are unsuccessful, or Contractor otherwise waives its right to seek such remedies, the SFMTA shall disclose only that portion of the Contractor's Proprietary Information that it is legally required to disclose.

13.1.5. Cooperation to Prevent Disclosure of City's Confidential Information.

Contractor shall use its best efforts to assist the SFMTA in identifying and preventing any unauthorized use or disclosure of any City's Confidential Information. Without limiting the foregoing, Contractor shall advise the City immediately in the event Contractor learns or has reason to believe that any person who has had access to City's Confidential Information has violated or intends to violate the terms of this Agreement, and Contractor will cooperate with the SFMTA in seeking injunctive or other equitable relief against any such person.

13.1.6. Remedies for Breach of Obligation of Confidentiality. Contractor acknowledges that breach of its obligation of confidentiality may give rise to irreparable injury to the SFMTA, which damage may be inadequately compensable in the form of monetary damages. Accordingly, the SFMTA may seek and obtain injunctive relief against the breach or threatened breach of the foregoing undertakings, in addition to any other legal remedies that may be available, to include, at the sole election of the SFMTA, the immediate termination, without liability to the SFMTA or City, of this Agreement.

13.1.7. Surrender of City's Confidential Information upon Termination.

Upon termination of this Agreement, including but not limited to expiration of the term, early termination or termination for convenience, Contractor shall, within five Days from the date of termination, return to the SFMTA any and all City's Confidential Information received from the

SFMTA, or created or received by Contractor on behalf of the SFMTA, which are in Contractor's possession, custody, or control.

13.1.8. Sensitive Security Information (SSI)

(a) Sensitive Security Information (SSI) Documents

13.1.8.a.1 Certain documents issued to Contractor and created by the Contractor as part of the Work under the Contract are Sensitive Security Information ("SSI Documents") as that term is defined in Section 2.94 (Sensitive Security Information).

13.1.8.a.2 The SSI Documents are identified by the markings printed on individual documents, drawings and exterior covers of documents and drawing sets that indicate that they are SSI Documents. SSI Documents are City's Confidential Information.

13.1.8.a.3 Contractor shall recognize that access to any part of the SSI Documents by unauthorized persons or organizations would pose significant security risk to the Project and public safety.

(b) Use of the SSI Documents

13.1.8.b.1 The Contractor is required to sign and agree to the terms and conditions of a Sensitive Security Information Confidentiality and Nondisclosure Agreement (NDA) to be authorized to access and handle any SSI required to perform the Work under Contract for this Project. For any questions or instructions regarding the SSI Documents or the NDA, Contractor shall contact the SFMTA using the contact information in Section 12.1 (Notices to Parties).

13.1.8.b.2 Contractor shall use the SSI Documents only for the purposes of performing the Work, and for no other purpose. Any documents prepared by the Contractor during contract performance containing information from an SSI Document shall be marked as SSI in the manner required by applicable federal law and the terms of the NDA.

13.1.8.b.3 Contractor shall guard the SSI Documents safe and secure at all times from disclosure to unauthorized personnel and shall only allow access to the SSI Documents to persons with a "need to know" for performing the Work. When the SSI Documents are not being used to perform the Work, the Contractor shall limit access to the SSI Documents to a locked, secure area so that the SSI Documents are not physically or visually accessible to persons who are not directly involved in performing the Work. When unattended, physical copies or media containing the SSI Documents must be secured in a locked container, office, or other restricted access area with access to the keys or combination limited to those with a need to know.

13.1.8.b.4 Contractor shall not copy, publish, circulate or use any of the SSI Documents for any purpose other than performing the Work, without first obtaining the SFMTA's written approval to do so.

(c) Disposal of the SSI Documents. At the termination of the Contract, Contractor shall return all other sets of SSI Documents or destroy them.

13.1.8.c.1 SSI Documents shall be returned to the SFMTA using the contact information in Section 12.1.

13.1.8.c.2 If not returned to the SFMTA, the SSI Documents must be destroyed in a manner that ensures recovery of the information contained therein would be difficult, if not impossible. Any means approved for the destruction of national security classified material such as machine shredding, may be used to destroy the SSI Documents. If no such means is available, the SSI Documents may be destroyed by cutting or tearing them into small pieces and assimilating it with other waste material. Compact discs or other physical electronic media containing the SSI Documents shall be broken to pieces. Electronic files containing the SSI Documents or any portion of them shall be deleted in a manner that prevents recovery of the deleted documents.

13.1.8.c.3 Upon expiration or termination of the Agreement, Contractor shall certify to the SFMTA on a form to be provided by the SFMTA that all SSI Documents have been returned or destroyed as required herein. Submit signed certification to the SFMTA using the contact information in Section 12.1.

(d) Liability for Failure to Secure or Misuse of the SSI Documents. Contractor shall be fully liable for any and all harm and damages that may arise from unauthorized persons or entities gaining access to the SSI Documents due to or arising from Contractor's failure to adhere strictly to the requirements of this Section 13. In addition to civil liability, Contractor is cautioned that violation of applicable laws and regulations concerning protection and use of Sensitive Security Information may subject Contractor to federal penalties.

(e) Subcontractors. Contractor shall include the provisions of this Section in any agreement with any Affiliate, or subcontractor or Supplier that will require access to the SSI Documents, and Contractor shall be responsible for its Affiliates', subcontractors' and Suppliers' adherence to the requirements of this Section 13.

13.2. Management of City Data

13.2.1. Access to City Data. City shall at all times have access to and control of City Data and shall be able without Contractor's assistance to retrieve it in a readable format, in electronic form and/or print, at any time, at no additional cost.

13.2.2. Ownership of City Data. The Parties agree that as between them, all rights, including all intellectual property rights, in and to the City Data and any derivative works of the City Data is the exclusive property of the City.

13.2.3. Use of City Data

(a) Contractor agrees to hold City Data received from, or collected on behalf of the City, in strictest confidence. Contractor shall not use or disclose City Data except as permitted or required by the Agreement or as otherwise authorized in writing by the City. Any Work using, or sharing or storage of, City Data outside the United States is subject to prior written authorization by the City. Access to City Data must be strictly controlled and limited to Contractor's staff assigned to this Project on a need-to-know basis only.

(b) Contractor is provided a limited non-exclusive license to use the City Data solely for performing its obligations under the Agreement and not for Contractor's own purposes or later use. Nothing herein shall be construed to confer any license or right to the City Data by implication, estoppel or otherwise, under copyright or other intellectual property rights, to any third-party.

13.2.4. Unauthorized Use. Unauthorized use of City Data by Contractor, Affiliates, subcontractors, or other third parties is prohibited. For purpose of this requirement, the phrase “unauthorized use” means the data mining or processing of data, stored or transmitted by the service, for commercial purposes, advertising or advertising-related purposes, or for any purpose other than security or service delivery analysis that is not explicitly authorized.

13.3. Litigation Holds. Contractor shall retain and preserve City Data in accordance with the SFMTA’s instruction and requests, including, without limitation, any retention schedules and/or litigation hold orders provided by the SFMTA to Contractor, independent of where the City Data is stored.

13.4. Notification of Legal Requests. Contractor shall immediately notify the SFMTA upon receipt of any subpoenas, service of process, litigation holds, discovery, requests, and other legal requests (Legal Requests) related to City’s Data under this Agreement, or which in any way might reasonably require access to City’s Data, and in no event later than 24 hours after it receives the request. Contractor shall not respond to Legal Requests related to City without first notifying City other than to notify the requestor that the information sought is potentially covered under a non-disclosure agreement. Contractor shall retain and preserve City Data in accordance with the City’s instruction and requests, including, without limitation, any retention schedules and/or litigation hold orders provided by the City to Contractor, independent of where the City Data is stored.

13.5. Disposition of City Data upon Termination. Upon request of City or termination or expiration of this Agreement, and pursuant to any document retention period required by this Agreement, Contractor shall promptly, but in no event later than 30 Days, return all City Data given to or collected by Contractor on City’s behalf, which includes all original media. Once Contractor has received written confirmation from City that the City Data has been successfully transferred to City, Contractor shall within 10 Days clear or purge all City Data from its servers, any hosted environment Contractor has used in performance of this Agreement, including its Affiliates’ and subcontractors’ environment(s), work stations that were used to process the Data or for production of the Data, and any other work files stored by Contractor in whatever medium. Contractor shall provide City with written certification that such purge occurred within five Days of the purge. Secure disposal shall be accomplished by “clearing,” “purging” or “physical destruction,” in accordance with National Institute of Standards and Technology (NIST) Special Publication 800-88, or the most current industry standard.

ARTICLE 14 INCLUDED APPENDICES

The documents listed below are attached to this Agreement as Included Appendices and are incorporated into this Agreement by reference.

Appendix A – Contract Specifications

Appendix B – Schedule of Prices and Calculation of Charges

Appendix B1 – Schedule of Prices

Appendix B2 – Calculation of Charges

Appendix C – Milestone Schedule and Payment

Appendix D – Contract Schedule

Appendix E – Contract Changes

Appendix F – Performance Bonds

Appendix F1 – Performance Term Performance Bond

Appendix F2 – Support Term Performance Bond

Appendix G – Federal Contract Requirements

Appendix H – SFMTA SBE Requirements

Appendix I – Performance and Service Level Requirements


Appendix J – SFMTA Policies and Procedures

- (1) SFMTA Track and Tunnel Access Procedures
- (2) Barcoding Procedures
- (3) Technology Change Control Policy and Procedures
- (4) System Safety Rail Change Control Board Policy
- (5) SFMTA Rail Rule Book
- (6) Train Control System Upload Template
- (7) SFMTA Technology Project Requirements

Appendix K –CBTC Software License Agreement

Appendix L – Reference Materials

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the day first mentioned above.

CITY	CONTRACTOR
San Francisco Municipal Transportation Agency	Hitachi Rail GTS USA Inc.
_____ Jeffrey P. Tumlin Director of Transportation	 _____ Ziad Rizk President and CEO 99 Park Avenue, Suite 1120 New York, NY, 10016
Authorized By: Municipal Transportation Agency Board of Directors	
Resolution No: _____	
Adopted: _____	<u>Acknowledgement of Large Vehicle Driver Safety Training Requirements:</u>
Attest: _____ Secretary to the Board	By signing this Agreement, Contractor acknowledges that it has read and understands Section 12.17: Large Vehicle Driver Safety Training Requirements.
Board of Supervisors	
Resolution No: _____	
Adopted: _____	
Attest: _____ Clerk of the Board	City Supplier Number: 0000009815
Approved as to Form:	
David Chiu City Attorney	
By: _____ David F. Innis Deputy City Attorney	

Appendix A
Contract Specifications

CONTRACT SPECIFICATIONS – SECTIONS 1-35

The Contract Specifications are voluminous and are provided as a separate file.

Appendix B
Schedule of Prices and Calculation of Charges

Appendix B1 Schedule of Prices

The tables contained in this Appendix B1 (Schedule of Prices) are to be used consistent with the instructions provided in Appendix B2 (Calculation of Charges).

SYSTEM PROCUREMENT

Table 1 contains the prices from the Contractor’s Price Proposal. All prices are in U.S. Dollars and include overhead and profit. The totals from this Table 1 are used to populate Appendix C (Milestone Schedule and Payment). Each line item in this table corresponds to a Phase. Payment Milestones in Appendix C are expressed as percentages of each of these line items. Payments for System Procurement will be made according to the procedures in Section B2.1.1 (Payment Procedures).

Table 1: System Procurement Price Schedule			
Line Items (Phases)	Labor	Material	Total
1. System Design	\$ 43,233,884.18	\$ 0	\$ 43,233,884.18
2. Central Equipment, simulators, tools, documentation, and training	\$ 9,813,395.92	\$ 8,211,811.12	\$ 18,025,207.04
3. On-board Equipment fitting	\$ 9,038,137.24	\$ 9,089,433.94	\$ 18,127,571.18
4. Pilot Phase	\$ 18,839,460.44	\$ 4,607,647.52	\$ 23,447,107.96
5. Subway Replacement*	\$ 12,622,811.28	\$ 4,680,537.79	\$ 17,303,349.07
6. N Expansion*	\$ 6,444,600.55	\$ 1,040,338.74	\$ 7,484,939.29
7. T Expansion*	\$ 6,266,574.13	\$ 1,124,723.09	\$ 7,391,297.22
8. K&M Expansions*	\$ 6,279,290.31	\$ 1,974,809.12	\$ 8,254,099.43
9. J Expansion*	\$ 3,324,029.66	\$ 607,862.70	\$ 3,931,892.36
10. L Expansion*	\$ 4,021,914.64	\$ 293,174.55	\$ 4,315,089.19
Total System Procurement Price	\$ 119,884,098.35	\$ 31,630,338.57	\$ 151,514,436.92

*May be adjusted for economic conditions in accordance with Section B2.3.1 (Economic Price Adjustment).

Prices do not include any applicable sales tax.

Table 2 (Pricing for Procurement Options) contains the pricing for procurement Options. The SFMTA may opt to equip additional railcars beyond the 219 included in the Total System Procurement Price, up to a limit of 30 additional railcars. The per-car price of equipping additional LRVs is stated in Table 2, Option 1.

The SFMTA also has an Option to equip its Heritage streetcars and maintenance Vehicles as part of the Project. The prices for these Options are included in Table 2 as Option 2 and Option 3. The Contractor’s design may not require equipping the Heritage streetcars and maintenance Vehicles to meet the requirements in the Contract Specifications. If the Contractor’s design does not require equipping the Heritage streetcars and maintenance Vehicles, Option 2 and Option 3 may be priced at \$0.

If the Contractor has filled out the optional tables on pages F-101 to F-114 of the RFP, then the Unit Prices for Option 2 will be the prices listed in those tables, for each type of Heritage Vehicle. If the Contractor does not fill out the optional pages, the Unit Price for Option 2 will be the Total Price divided by 50.

Table 2: Pricing for Procurement Options. Price sheet for Options for procurement. These original Contract Rates will be adjusted for economic conditions in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time the Option is exercised.		
	Price per kit	Total Price
1. Option 1. Additional onboard fitment per LRV4 railcar up to a maximum of 30 LRVs (including both Equipment and Services required to equip each LRV)	\$ 145,647.11 / vehicle	\$ 4,369,413.15
2. Option 2. Additional onboard Equipment kits per Heritage streetcar up to a maximum of 50 Vehicles (including Equipment, testing, and services required to equip each streetcar)	\$ 220,578.60 / vehicle	\$ 11,028,929.75
3. Option 3. Additional onboard Equipment kits per maintenance Vehicle up to a maximum of 30 Vehicles (including Equipment, testing, and services required to equip each streetcar)	\$ 285,233.27 / vehicle	\$ 8,556,998.06
4. Option 4. Additional Interlocking Equipment and design services to furnish up to 10 additional Interlockings as described in Contract Specifications Section 16.2 (System Architecture).	\$ 764,187.40 / Interlocking	\$ 7,641,873.99

Table 2: Pricing for Procurement Options. Price sheet for Options for procurement. These original Contract Rates will be adjusted for economic conditions in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time the Option is exercised.

	Price per kit	Total Price
5. Option 5. Additional Central Emergency Stop Buttons for Backup Control Center as described in Contract Specifications Section 27.7.3 (Workstations).	Lump sum	\$ 656,305.00
6. Option 6. Additional design services common to Heritage and/or Maintenance Vehicles, from PDR to Final Design.	Lump Sum	\$ 12,508,199.93
Total Price of All Procurement Options		\$ 44,761,719.89

Prices do not include any applicable sales tax.

SYSTEM SUPPORT

Table 3 (System Support Prices) sets out the Support Fees the SFMTA will pay for the base Support Term and each of the 5-year Options. The table also has a row showing the full support fees that could be paid to the Contractor prior to Final Acceptance, using the phasing in of support described in Section B.2.2.5 (Calculation of Phase-in Adjustments). Column A states the original monthly support fees from the Contractor’s Price Proposal, in 2024 dollars.

The Monthly Support Fee will be adjusted annually to compensate for economic conditions as described in Section B2.3.1 (Economic Price Adjustment). The resulting annual adjusted Monthly Support Fee will be stated in Column B. The values in Column B will be used to calculate performance-based adjustments, as described in Section B.2.2.2 (Payment Procedures).

Column D states the total support fees due the Contractor over the full Support Term and Optional extensions. Column D = Column A × Column C.

All prices are in USD and include overhead and profit.

Table 3: System Support Prices				
	A. Original Monthly Support Fee (Contract Rate)	B. Adjusted Monthly Support Fee	C. Number of Months	D. Total Support Fee
0. Phase-In Support Fees, not to exceed				\$ 11,115,083.00
1. Initial Support Term: 10-year System support services	\$ 373,511.38 / month	\$ ___ / month	120	\$ 44,821,366.17
2. Option 7: first 5-year extension for System support services	\$ 446,139.26 / month	\$ ___ / month	60	\$ 26,768,355.82
3. Option 8: second 5-year extension for System support services	\$ 518,344.40 / month	\$ ___ / month	60	\$ 31,100,664.05
Total Support Service Price				\$ 102,690,386.04

Prices do not include any applicable sales tax.

Rates for Additional Services

Table 4 (Hourly Labor Rates by Position) state Contractor’s Fully Burdened Hourly Labor Rates, for the purposes of calculating the costs of additional design/software work under a Change Order or Contract Modification. Contractor shall use these rates when calculating its estimates for all Change Orders and Contract Modifications. These original Contract Rates may be adjusted for economic conditions in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time SFMTA issues a Request for Contract Change or receives a Request for Contract Change from Contractor.

Table 4 states hourly rates for Contractor’s personnel assigned to the Project. It is not necessary to include the names of individual personnel.

Table 4: Hourly Labor Rates by Position.		
Position / Classification	Education / Experience	Hourly Rate
Project Director	Technical Degree	\$325.00
Project Manager	Technical Degree, 15 years’ experience	\$290.00
Sr. Software Engineer	Technical Degree, 10 years’ experience	\$260.00
Electrical Engineer	Technical Degree, 10 years’ experience	\$235.00
Software Engineer	Technical Degree, 10 years’ experience	\$235.00
Planner	Planning Skills, 10 years’ experience	\$220.00
Project Admin	2 years’ experience	\$175.00

Table 4: Hourly Labor Rates by Position.		
Position / Classification	Education / Experience	Hourly Rate
Project Cost Controller	Degree, 5 years' experience	\$185.00
Contract Manager	Degree, 5 years' experience	\$230.00
Procurement Specialist	Degree, 5 years' experience	\$185.00
Quality Analyst	Technical Degree, 5 years' experience	\$185.00
Publication Specialist	2 years' experience	\$175.00
System Operations	Technical Degree, 5 years' experience	\$230.00
System Design	Technical Degree, 5 years' experience	\$230.00
System Engineering Manager	Technical Degree, 15 years' experience	\$265.00
Project Design Authority	Technical Degree, 10 years' experience	\$260.00
Data Comms Engineer	Technical Degree, 10 years' experience	\$250.00

Table 4: Hourly Labor Rates by Position.		
Position / Classification	Education / Experience	Hourly Rate
RAM Engineer	Technical Degree, 10 years' experience	\$235.00
Site Infrastructure Designer	Technical Degree, 10 years' experience	\$235.00
Senior Safety and Safety Assurance	Technical Degree, 15 years' experience	\$290.00
Senior Quality Assurance and Configuration	Technical Degree, 15 years' experience	\$265.00
Senior Signaling Designer	Technical Degree, 15 years' experience	\$290.00
Safety and Safety Assurance	Technical Degree, 5 years' experience	\$230.00
Quality Assurance and Configuration	Technical Degree, 5 years' experience	\$230.00
Signaling Designer	Technical Degree, 5 years' experience	\$260.00
Factory or Field Technician	Technical Degree, 2 years' experience	\$180.00

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
1	ATS Infrastructure	-
2	PC-WORKSTATION Z4 G4 QC 3.9GHZ 8GB 1TB	\$7,055.92
3	THIN CLIENT-16GB RAM 128GB SSD DPx4 F/O	\$8,718.82
4	MONITOR-24" LED 1920x1200 16:10 300NITS	\$1,036.63
5	MOD-ETH SW 6P DIO+6P RLY+2P FE ET	\$1,997.17
6	PATCH PANEL-48 PORT 2U RJ45 CAT5E SHIELD	\$1,921.29
7	FIREWALL-4P 10/100/1000 8 GB SFP 1U	\$30,100.89
8	PC ASSEMBLY-DC	\$13,200.00
9	PDU-2U 12 CB 2A C-13 OUTLETS	\$6,935.41
10	PSU-DIN 100/240VAC IP 24VDC@10A OP 240W	\$1,075.91
11	CABLE-PATCH CAT5E UTP BLU 1M LSZH	\$56.12
12	CABLE-PATCH CAT5E UTP RED XVR 2M LSZH	\$49.58
13	CABLE-PATCH CAT5E UTP BLU 3M LSZH	\$124.64
14	CABLE-PATCH CAT5E UTP BLU 2M LSZH	\$86.41
15	CABLE-PATCH CAT5E UTP BLU 5M LSZH	\$159.80
16	CABLE ASSY-F/O MM DPX LC/LC OM4 5M	\$265.84
17	CORD-PWR AC 10A/250V C14 C13 2.5M BLK ZH	\$273.68
18	CORD-PWR AC 10A/250V C14 C13 4M BLK ZH	\$175.37
19	TERMINAL BLOCK-M4/6.SN RM GREY	\$24.71
20	THERMOSTAT-55C 120VAC 15A SNAPACTION N/O	\$77.90
21	MOD-ETH SW 6P GBE+4P GBE SFP 10V-60VDC W	\$6,387.85
22	MODULE-RMT I/O ETHERNET 6DIO/6RLY/SNMPV3	\$3,474.93
23	PSU-DIN 100/240VAC IP 24VDC@0.65A OP 15W	\$328.55
24	TRANSCVR-SFP 1FX SM LC DPX 10KM 100MB AC	\$773.01
25	MOD-ETH SW 12P GBE+4P GBE SFP 10V-60VDC	\$1,598.58
26	TERM BLOCK-END CLAMP 8x47MM GRY	\$8.23

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
27	MODULE-ETHERNET SW 8GB+4 2.5GB L3 MR ET	\$24,103.96
28	MODULE-MEDIA 4FX CAGE 2.5 GIGABIT ETHERN	\$4,840.06
29	MODULE-MEDIA 4FX SFP CAGES+4TX GB ET/CC	\$4,546.27
30	Data storage unit DUAGON P/N 06ME02-11	\$9,309.33
31	PSU-DIN 100/240VAC / 24VDC@5A 120W AREMA	\$806.78
32	CABLE ASSY-M12-F/PGTL 5P A-CODE OS 0.6M	\$136.35
33	TRANSCVR-SFP SM LC DPX 1000BASE-LX 10KM	\$280.06
34	LAN - MOD-ETH SW 6P GBE+4P GBE SFP+1SPCO L2 ET	\$3,886.70
35	Hardened Gigabit Ethernet L3 1RU; 20 100/1000 BaseX SFP	\$25,925.99
36	Modular 180W AC backup power supply	\$2,256.54
37	Mounting bracket & Side mounting rails kit	\$636.70
38	1000Base-LX Industrial Gigabit Ethernet optical transceiver	\$1,048.07
39	OSA 5401 SFP SyncPlug GNSS and PTP T-GM SFP.	\$4,562.40
40	GNSS Roof Antenna Kit for 5401	\$1,036.91
41	Lighting Protector Kit (EMP Kit)	\$395.01
42	RG223 Antenna LMR400 Cable	\$131.67
43	MEDIA CNVRTR-GBE SFP 8-15VDC TB EXT TEMP	\$1,502.76
44	FIREWALL-12xGE 4xGE-SFP 2x10GE-SFP 1xUSB	\$16,458.87
45	FIREWALL-5P GBE 8GB RAM 240GB SSD 3600	\$16,458.87
46	PC-PE R650 6314U 256GB 4x2.4TB VSAN 1U	\$33,273.26
47	CNVRTR-DC/DC 9-36V/12V 15W DIN MT	\$329.18
48	NETWORK SWITCH-24P-GBE 4-10G SFP 2-100G	\$25,925.99
49	NETWORK SWITCH-12P-GBE SFP 3-100GBE SFP	\$25,925.99
50	PDU-VERTICAL 230VAC 32A 36 C13/6 C19 10F	\$3,825.04
51	UPS-500VA 300W 120VAC O/P 6-5/15R LI 1U	\$11,936.35
52	PBA-UPS SNMP MANAGEMENT	\$3,474.93

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
53	PSU-DIN 100/240VAC IP 24VDC@5A OP 120W	\$571.48
54	NETWORK SWITCH-28P 10/25GBE BK-TO-FT AIR	\$25,925.99
55	PSU-3600 SECURITY FIREWALL	\$237.01
56	TRANSCEIVER-SFP RJ45 GBE-T 100M	\$4,536.07
57	CABLE-PATCH CAT6A F/UTP GRY 1M LSZH	\$33.44
58	CABLE-PATCH CAT6A F/UTP RED XVR 1M LSZH	\$33.44
59	CABLE-PATCH CAT6A F/UTP GRY 2M LSZH	\$33.44
60	CABLE ASSY-DAC QSFP28 100G 0.5 M DELL	\$105.34
61	CABLE ASSY-M12-M/RJ45 8P X-CODE CAT6A 1M	\$272.39
62	CABLE ASSY-M12-M/RJ45 8P X-CODE CAT6A 3M	\$331.32
63	CABLE-PATCH F/O SM DPX LC-LC 2M LSZH	\$406.41
64	CABLE-PATCH F/O MM DPX LC-LC 2M LSZH	\$234.77
65	CABLE ASSY-POWER MCG	\$334.41
66	TRANSCEIVER-SFP SINGLE-MODE LC DUPLEX 5K	\$4,536.07
67	TRANSCVR-SFP MM LC DPX 10GBASE-SR DELL	\$773.01
68	TRANSCVR-SFP 1FX SM/MM LC DPX 20KM GB ET	\$1,433.93
69	TRANSCVR-SFP SM LC DPX 10GBASE-LR DELL	\$4,536.07
70	CIRCUIT BREAKER-2P 30A 240VAC TMC DIN	\$653.42
71	iSFP-10G-LR	\$5,970.00
72	Wayside/Trackside Infrastructure	-
73	ZC Signalling Controller Assembly (2 x 2oo2)	-
74	SUBRACK ASSY-MPU 2oo2	\$3,268.70
75	MPU SUBRACK (IM)	\$6,320.21
76	MPU PSU Hardware Unit	\$1,223.42
77	VSC Hardware Unit	\$1,223.42
78	PBA-CPU SC33 x5 E3930 3U 8HP	\$3,469.53

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
79	PC-CPU X7-E3950 4C 1.6GHZ M12 SSD 120GB	\$6,029.78
80	TERM BLOCK-4P 1-LVL 5.2MM PT2,5 BLU	\$9.35
81	TERM BLOCK-4P 1-LVL 5.2MM FD/THRU PT GRY	\$2.21
82	CABLE ASSEMBLY-C14/HAN3A POWER	\$1,144.95
83	CABLE ASSEMBLY-C14/FREE END	\$788.48
84	CABLE ASSEMBLY-SERIAL DB9F/FREE END	\$804.87
85	CABLE ASSEMBLY- ETHERNET M12X-M12A	\$210.61
86	MOD-MEDIA SW 6P DIO+6P RLY+2P RS485 ET	\$1,448.38
87	MODULE-DE9 M/F BREAKOUT SHIELD DIN RAIL	\$329.18
88	ID-PLUG (FOR COMMS BOARD)	\$2,633.42
89	TERM BLOCK-4P 2-LVL 26-14AWG 3.5MM GN/YL	\$29.26
90	CABLE ASSEMBLY-SERIAL DB9M/FREE END	\$97.04
91	CABLE-PATCH F/O SM DPX LC-LC 1M LSZH	\$97.04
92	OC-UR Equipment (Remote I/O)	-
93	ASSEMBLY-RIO CHASSIS NON-REDUNDANT	\$4,915.64
94	SIDE PLATE ASSY-LEFT RIO	\$658.35
95	FILTER-PWR LINE 250VAC 6A 96dB @ 1MHZ	\$70.94
96	SURGE PROTECTOR-230VAC 10KA TYPE 2 CH MT	\$148.13
97	SIDE PLATE ASSY-RIGHT RIO	\$658.35
98	PBA-RIO MOTHERBOARD NON REDUNDANT	\$5,228.16
99	ASSEMBLY-RIO CHASSIS EXTENSION	\$4,983.15
100	PBA-RIO MOTHERBOARD EXTENSION	\$5,228.16
101	IO CARD ASSY-CONCENTRATOR	\$4,860.31
102	PBA-CONCENTRATOR MAIN	\$5,228.16
103	PBA-CONCENTRATOR D/B	\$5,228.16
104	Connector, cable	\$329.18

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
105	Cable, Fiber Optic	\$329.18
106	SFP Fiber Optic Transceiver	\$329.18
107	IO CARD ASSY-12I/6O	\$5,196.89
108	PBA-RIO OUTPUT (6 OP)	\$5,228.16
109	PBA-RIO INPUT (12 IP)	\$5,228.16
110	Cable OC-UR Generic Input	\$1,035.76
111	Cable OC-UR Generic Output	\$1,144.95
112	Cable OC-UR Generic Vital Supervision	\$788.48
113	Internal Cables (Remote IO DCS Interface)	\$788.48
114	Cable OC-UR Generic Extension	\$1,141.06
115	Output OC-UR Generic Redundancy	\$804.87
116	Output OC-UR Generic AC Power	\$210.61
117	Output OC-UR Serial Pass Through Jumper	\$136.35
118	Output OC-UR Serial Loop Back Jumper Occ'd	\$97.04
119	RELAY-VITAL B1 2FB-4F-2B 4A 30V BIAS EHD	\$3,769.08
120	SOCKET-RELAY SINGLE TYPE ST	\$415.26
121	SWITCH-PUSHBUTTON 1NO HARMONY XB4	\$328.55
122	CONTACT-QN1 RELAY	\$0.66
123	CIRCUIT BREAKER-1P 1A 230VAC TRIP C	\$65.80
124	CIRCUIT BREAKER-1P 4A 230VAC TRIP C	\$64.95
125	RES-MF TYPE MRS25F 1K69 1% .6W	\$0.33
126	MODULE-I/F CARRIER 16-POLE SCREW DIN	\$116.86
127	TERM BLOCK-M4/6.D1 RM GREY	\$12.81
128	Switch Control Relay - QBCA1	\$808.33
129	Switch Control Relay - Socket	\$23.04
130	SOCKET KIT-RELAY TYPE B1	\$957.91

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
131	POWER DISTRIBUTION	-
132	METER-INSULATION RESISTANCE 72/94V DIN	\$2,278.24
133	MODULE-RMT I/O 2-PT ETHERNET SW 16DI	\$328.55
134	FUSE CARTR-6A 250V 5X20MM MED-ACT CER	\$4.08
135	CIRCUIT BREAKER-4 POLE 16A 480VAC AUX	\$427.80
136	CIRCUIT BREAKER-2 POLE 13A 240VAC AUX	\$427.80
137	CIRCUIT BREAKER-2 POLE 0.5A 80VDC AUX	\$446.53
138	CIRCUIT BREAKER-2 POLE 4A 240VAC AUX	\$682.55
139	CIRCUIT BREAKER-2 POLE 0.5A 240VAC AUX	\$372.66
140	CIRCUIT BREAKER-2 POLE 5A 240VAC AUX	\$427.80
141	TERM BLOCK-2P 1-LVL 18MM FUSE UK10,3-CC	\$55.04
142	TERM BLOCK-M4/6 RM GREY	\$3.95
143	TERM BLOCK-2P 1-LVL 8.2MM UTME6 GRY	\$29.26
144	TRANSFORMER-CURRENT SLD CORE 50:5 2.0VA	\$95.10
145	PSU-DIN 100/240VAC IP 24VDC@1.3A OP 30W	\$328.55
146	CIRCUIT BREAKER-2 POLE 6A 240VAC AUX	\$350.57
147	TRANSFORMER-240V/480V-120/240V 1PH 500VA	\$1,645.89
148	TRANSFORMER-240V/480V-120/240V 1PH 1.5KV	\$1,645.89
149	METER-PANEL DIGITAL POWER 3-PH 277VAC 5A	\$237.01
150	MONITOR-GND FAULT 690VAC/1KVDC DIN MNT	\$8,241.95
151	CIRCUIT BREAKER-4P 50A 347VAC TMF MC	\$1,535.84
152	CIRCUIT BREAKER-3 POLE 35A 480VAC AUX	\$653.42
153	CIRCUIT BREAKER-3 POLE 20A 480VAC AUX	\$415.62
154	CIRCUIT BREAKER-3 POLE 16A 480VAC AUX	\$653.42
155	CIRCUIT BREAKER-2 POLE 13A 240VAC AUX	\$408.08
156	CIRCUIT BREAKER-2 POLE 8A 240VAC AUX	\$446.53

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
157	CIRCUIT BREAKER-2 POLE 1A 240VAC AUX	\$446.53
158	CIRCUIT BREAKER-2 POLE 10A 240VAC AUX	\$427.80
159	CIRCUIT BREAKER-2 POLE 3A 240VAC AUX	\$372.66
160	CIRCUIT BREAKER-2 POLE 2A 80VDC AUX	\$411.37
161	CIRCUIT BREAKER-2 POLE 1A 80VDC AUX	\$593.90
162	TRANSFORMER-CURRENT SLD CORE 100:5 2.0VA	\$95.10
163	CNVTR-DC/DC 12/12V O/P 8.4-36V 15.6W	\$973.21
164	PSU-28VDC 20A I/P 85-264V 47-63HZ	\$8,690.29
165	MODULE-SWITCH PSU TYP RPS 120 EEC	\$6,717.89
166	MODULE-REDUNDANCY DUAL-IN 12-28VDC 20A	\$100.46
167	RELAY-DPDT 12V 8A DIN MNT	\$110.08
168	TRANSFORMER-240V/480V-120/240V 1PH 250VA	\$382.97
169	TERM BLOCK-M10/10 RM GREY	\$10.73
170	CIRCUIT BREAKER-2 POLE 2.5A 240VAC AUX	\$370.00
171	CIRCUIT BREAKER-2 POLE 4A 80VDC AUX	\$364.89
172	CIRCUIT BREAKER-4 POLE 35A 480VAC AUX	\$369.07
173	SWITCH-CHANGEOVER 3-POLE 25A 750V DIN	\$1,234.42
174	SWITCH-CHANGEOVER 4-POLE 40A 750V DIN	\$1,234.42
175	TRANSFORMER-415/400V 3P 6.7KVA	\$6,423.93
176	TRANSFORMER-ISO 415V-415Y/240V 3PH 12KVA	\$7,257.77
177	TRANSFORMER-415V/380V/220V 3PH 15KVA	\$7,257.77
178	TRANSFORMER-ISO 415V-415Y/240V 3PH 25KVA	\$6,583.55
179	TRANSFORMER-ISO 415V-415Y/240V 3PH 60KVA	\$1,585.81
180	UPS-10KVA 3PH 400/1PH 230	\$11,936.34
181	BATTERY ASSEMBLY FOR 10kVA UPS- 4 HOURS Backup	\$23,773.63

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
182	UPS-40KVA 3PHASE 400/1PH 230	\$22,986.36
183	BATTERY ASSEMBLY FOR 40kVA UPS- 4 HOURS Backup	\$78,361.65
184	Cable Termination Frame (CTF)	-
185	TERM BLOCK-4P 2-LVL 6.2MM KNIFE DISCON	\$22.94
186	TERM BLOCK-6P 1-LVL 8.2MM GREEN/YLW	\$17.35
187	TERM BLOCK-4P 2-LVL 6.2MM W/GRND UTTB	\$22.94
188	SP-Protection Module @480 Vac	\$342.48
189	SP-Protection Module @110 Vac	\$82.03
190	SP-Protection Module @24 Vdc	\$352.22
191	SP-Protection Module @220 Vac	\$514.34
192	SPD Base - SPD Base	\$62.08
193	Trackside Equipment	-
194	Transcore Tag (AT5415)	\$88.81
195	CESB	\$2,287.78
196	PESB	\$2,287.78
197	RF Splitter	\$240.30
198	5G Antenna KP antenna	\$1,505.66
199	PSU	\$205.41
200	RF Cable	\$288.24
201	PSE- Standard	\$13,825.45
202	Onboard Infrastructure	-
203	SUBRACK 3U VOBC I/F-EMPTY	\$1,618.04
204	PBA-VOBC I/F MOD INPUTS (96-110V DC)	\$144.84
205	PBA-VOBC I/F MOD FOR RLY PNL (24-36V DC)	\$366.07
206	PBA-HU I/F MODULE VOBC OUTPUTS	\$894.83

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
207	PBA-VOBC I/F MOD FOR DOM-R	\$921.70
208	PBA-VOBC I/F MOD-POWER	\$1,059.19
209	SA-VOBC FAN TRAY 1U ASSY-COMplete	\$1,648.78
210	SA-VOBC LDC MVB TRAY-2U-COMplete	\$37,516.12
211	SA-VOBC RELAY PANEL ASSY-COMplete	\$8,826.27
212	PSU-110VDC	\$4,126.17
213	PSU MODULE 110V 24/24V	\$2,315.78
214	MODULE-POWER INPUT FILTER	\$438.56
215	PBA-CIQ3 CPU 3U 6HP COATED	\$3,751.19
216	DIGITAL INPUTS MODULE VITAL	\$1,715.19
217	MODULE-DIGITAL OUTPUT VITAL SSR 96-110V	\$1,635.26
218	DIGITAL OUTPUT MODULE RELAY	\$2,633.42
219	TRAIN MOTION MODULE (TMM)	\$1,624.60
220	MODULE-ANALOG I/O AND PWM	\$1,583.56
221	ID-SIB-E SERVICE INTERFACE BOARD (2oo2)	\$4,577.28
222	ID-PLUG (DUAL FOR ID-SIB)	\$924.03
223	DIGITAL INPUTS MODULE VITAL	\$1,715.19
224	MODULE-ETHERNET SW 12-PT M12	\$10,409.37
225	ASSEMBLY-ACCELEROMETER MEMS	\$5,351.25
226	READER-HD RFID 2.45GHZ ISM	\$1,102.74
227	CNVRTR-DC/DC 24/24V O/P 65-150V I/P 132W	\$3,990.62
228	CABLE ASSEMBLY-POWER TIU PSU	\$1,076.85
229	Transcore TIU 902-928 MHZ AI1422R	\$18,147.55
230	ASSY-VID PLUG	\$621.88
231	Transcore TI Antenna 902-928 MHz AA3233	\$4,505.62
232	Accelerometer+ speed sensor cable	\$2,671.15

Table 5. Spare Part Price Sheet. Price sheet for billing Reimbursable Parts under the terms provided in Section B2.2.3 (Monthly Support Fee Calculation). These Contract Rates will be adjusted in accordance with procedures in Section B2.3.1 (Economic Price Adjustment) at the time of invoice. Attach additional pages as necessary.

Item	Description	Spare Part Unit Price
233	Transcore TI signal cable	\$265.19
234	Transcore TI antenna cable	\$835.68
235	Radio Antenna cable	\$1,532.49
236	MCG PSU (63703827AA-15900-9950)	\$13,905.88
237	Input IO cable	\$8,959.29
238	Ethernet cable	\$377.01
239	VOBC power cable	\$3,850.63
240	Network switch power	\$900.46
241	Network switch power	\$900.46
242	Mating connector Kit	\$2,131.85
243	CIRCUIT BREAKER-1 POLE 6A TRIP Z MCB	\$150.27
244	CIRCUIT BREAKER-1 POLE 8A TRIP Z MCB	\$224.77
245	CIRCUIT BREAKER-1 POLE 10A TRIP Z MCB	\$250.24
246	CIRCUIT BREAKER-1 POLE 6A TRIP K MCB	\$236.02
247	5G 4X4 MIMO Antenna	\$49,969.14
248	GNSS Antenna	\$3,620.95
249	5G MCG + UBLOX 9 Option for GPS	\$8,051.68

Prices do not include any applicable sales tax.

Appendix B2 Calculation of Charges

Contractor's compensation shall be calculated using the following tables and procedures.

B2.1 System Procurement Procedures

B2.1.1 Payment Procedures

B2.1.1.1 Milestone Payments. From NTP until Final Acceptance, the SFMTA will pay Contractor the amounts set out in Appendix C (Milestone Schedule and Payment), either following the completion of the Milestone or proportional to progress made towards the Milestone, as described in this Section. Major Milestones are marked in boldface type in Appendix C and are marked with "MM" in the corresponding row.

B2.1.1.1.1 Payment Made Upon Completion. The SFMTA will only make payment for a Major Milestone after the SFMTA has approved all Work for that Milestone, as described in the Project Management Plan. Approval for CDRL submittals is described in Contract Specifications Section 3.5.1.4 (SFMTA Review).

B2.1.1.1.2 Progress Payments. The Contractor may invoice for progress made against non-major Milestones or Option Payments on a monthly basis, or less frequently. SFMTA will only make payments for Major Milestone work following completion of that Work.

B2.1.1.2 Option Payments. The SFMTA will pay Contractor for Work performed and Equipment delivered under Options for additional Vehicle Fitments from Table 2 (Pricing for Procurement Options), upon SFMTA's Acceptance of the delivered and tested Equipment. Contractor may invoice for progress made based on the number of kits delivered, tested and accepted.

B2.1.2 Retention. The SFMTA will retain five percent (5%) of each payment to Contractor, as provided in General Provisions, Section 4.5.3.

B2.2 System Support Procedures

B2.2.1 Monthly Support Fee. In exchange for Support Services described in Contract Specifications, Section 32 (Support Services), the SFMTA will pay Contractor a Monthly Support Fee. The Monthly Support Fee is stated in Table 3 (System Support Prices) for the Initial Support Term and Contract Term extension Options.

B2.2.2 Payment Procedures. Starting on the first day of each month, Contractor shall perform the calculations described in this Section B2.2 to adjust the Monthly Support Fee based on System and Contractor performance for the previous calendar month, and submit an invoice to SFMTA for payment no later than the fifth day of the month.

B2.2.2.1 Invoice Start Date. The Contractor shall not bill for Support Services until the first day of the month following the SFMTA’s Conditional Acceptance of the Subway Replacement Phase.

B2.2.2.2 Invoice Format. The Contractor’s monthly invoice shall be in the format described in General Provisions, Section 4.5.5 (Invoice Format) and show Contractor’s adjustments and calculations using the procedures in this Section B2.2 (System Support Procedures).

B2.2.2.3 Payment. The SFMTA will verify Contractor’s calculation of compensation owed and performance adjustments, and will issue payment to Contractor of the adjusted amount based on its verification.

B2.2.2.4 Disputes. Disagreements between the Parties over the adjusted Monthly Support Fee shall be resolved using the Dispute Resolution Procedures provided for in General Provisions, Section 12.8 (Dispute Resolution Procedures).

B2.2.3 Monthly Support Fee Calculation. The Monthly Support Fee set out in Appendix B1 (Schedule of Prices), Table 3, Column A will be adjusted by SFMTA to account for economic conditions in accordance with Section B2.3.1 (Economic Price Adjustment), and the adjusted amounts will be inserted into Appendix B1 (Schedule of Prices), Table 3, Column B annually, beginning after Final Acceptance. The Monthly Support Fee will be further adjusted based on performance in accordance with Section B.2.2.3.2. Prior to Final Acceptance, the Monthly Support Fee will be “phased-in” depending on the number of Deployment Phases which have received Conditional Acceptance by the SFMTA, as set out in Appendix B2, Table 8. The Monthly Support Fee will be further reduced if Contractor does not complete RAM Demonstration Testing, as described below in Section B2.2.3.3.

B2.2.3.1 Adjustments for Phase-In. For each of the months following Subway Conditional Acceptance but prior to Final Acceptance, Contractor shall multiply the Monthly Support Fee from Appendix B1 (Schedule of Prices), Table 3, Column A by the Phase-in Adjustment Factor calculated using the instructions in Section B2.2.5 (Calculation of Phase-in Adjustments), below.

B2.2.3.2 Adjustments for Performance. For each of the months following Final Acceptance, Contractor shall multiply the Adjusted Monthly Support Fee from Appendix B1 (Schedule of Prices), Table 3, Column B by the Performance Adjustment Factor from Appendix B2 (Calculation of Charges), Table 7, Row 7 calculated using the instructions in Section B2.2.4, below.

B2.2.3.3 Adjustment for Failure to Demonstrate RAM. If Contractor has initiated but not completed the Initial Reliability and Maintainability Demonstration Testing (RMDT) or the Contractor has initiated but not completed the Final RMDT as specified in Contract Specifications, Section 30.6.5 (RAM Verification –

Reliability, Availability and Maintainability Demonstration Testing, the Monthly Support Fee, after all adjustments described in this Section B2.2.3 have been made, shall be reduced by 50 percent.

B2.2.3.4 Reimbursement for Spare Parts. Contract Specifications, Section 32.4.1 (Provision of Equipment and Spare Parts) of the Contract Specifications permits Contractor to invoice the SFMTA for Reimbursable Parts. The Contractor shall use the prices from Appendix B1 (Schedule of Prices), Table 5, as adjusted according to B2.3.1 (Economic Price Adjustment), to calculate this reimbursement and add this amount to the monthly support invoice as a separate line item.

B2.2.4 Calculation of Performance-Based Monthly Support Fee Adjustments. Up to 20% of the Monthly Support Fee is variable based on Contractor's and System Performance relative to the Performance Targets listed in Appendix I (Performance and Service Level Requirements). If Contractor's and System Performance meets the Performance Targets, Contractor receives 100% of the Monthly Support Fee. For performance exceeding the targets, Contractor may receive up to a 140% adjustment of the variable portion of the support fee (totaling 108% of the monthly support Fee), as set out in Tables 6 and 7 using the instructions in this section. For performance not meeting the targets, the variable portion will be reduced, according to the schedule in Table 6. The variable portion can be reduced to zero, in which case Contractor will receive 80% of the Monthly Support Fee, which is the minimum, fixed portion of the fee. Examples of these calculations are included in the RFP No. SFMTA-2022-40-FTA, Appendix N.

B2.2.4.1 Performance Calculations. For each month that a Support Fee is invoiced, Contractor shall calculate Availability, Reduction in Operating Margin Events, Loss of Critical Function, and Support Tickets Exceeding Resolution Time according to the methodology provided in Contract Specifications, Section 30 (Reliability, Availability, and Maintainability (RAM)). The SFMTA will review and verify Contractor's calculations.

B2.2.4.2 Availability Performance Score Calculation. Contractor shall enter the month's availability, A_s , into the formula in Row 1. The formula yields the percent. Round down to the nearest value of 140%, 120%, 100%, 80%, 60%, 40%, 20%, 0%. If the formula produces a value less than 0, use 0%. This is the Performance Score for Availability. Enter this Value in Row 1, Column B of Appendix B2 (Calculation of Charges), Table 7.

B2.2.4.3 Other Performance Score Calculations. The Contractor shall compare the actual number of Operating Margin Events, Loss of Critical Function events and open Unsatisfactory Issues during the month and compare those counts to the values in Appendix B2 (Calculation of Charges), Table 6.

B2.2.4.3.1 For each of these three parameters, the Contractor shall select the column corresponding to the largest number that is equal to or lower than the actual performance this month. If no values in the table are lower than the actual performance, the Contractor shall select the 140% column.

B2.2.4.3.2 For the Unsatisfactory Issues row, the Contractor shall select the 120% column if there have been zero Unsatisfactory Issues this month and the two months preceding for a total of three (3) consecutive months. The Contractor shall select the 140% column if there have been zero Unsatisfactory Issues this month and the five months preceding for a total of six (6) consecutive months.

B2.2.4.3.3 Use the Performance Score from the header (i.e., 140%, 120%, 100%, 80%, 60%, 40%, 20%, or 0%) of the selected column in Table 6 and enter those percentages into Column B of Table 7 for the corresponding parameters. For each column selected at 140% or 120%, the Contractor shall enter “100%” into Column B of Table 7 in place of 140% or 120% if ANY of the four parameters is less than 100% this month.

B2.2.4.4 Calculation of Performance Adjustment Factor. To calculate the Performance Adjustment Factor, the Contractor shall multiply each parameter’s Performance Score in Column B of Table 7 by the corresponding weights in Column C of Table 7. Add the four weighted Performance Scores together and enter into Row 5, Column D of Table 7. Add 80% (representing the fixed fee) to this total and enter into Row 7, Column D of Table 7. The result is the Performance Adjustment Factor.

The Contractor shall use Table 6 (Calculation of Performance Scores) to convert the monthly performance of the CBTC System and Contractor into Performance Scores in accordance with the procedures set out in Section B2.2.4 (Calculation of Performance-Based Monthly Support Fee Adjustments). The Contractor shall then enter resulting Performance Scores into Table 7 for calculation of the monthly Performance Adjustment Factor.

Table 6: Calculation of Performance Scores										
Weight	Parameter	Performance Targets	Performance Score							
			140%	120%	100%	80%	60%	40%	20%	0%
4%	Availability A_s	99.96%	99.99% or greater	99.98%	99.96%	99.94%	99.92%	99.90%	99.88%	< 99.98%
4%	Reduction in Operating Margin Events	88	1 or less	4	7	9	11	13	15	> 15
2%	Loss of Critical Function	1	0 in past 2 years	0 in past 12 months	1 in past 12 months	1 in past 9 months	1 in past 6 months	1 in past 3 months	2 in past 12 months	> 2 in past 12 months
10%	Unsatisfactory Issues Tally	0	**	*	0	5	10	15	20	> 20

* 120% awarded for three consecutive months with zero Unsatisfactory Issues

**140% awarded for six or more consecutive months with zero Unsatisfactory Issues

The Contractor shall fill in Table 7 (Calculation of Performance Adjustment Factor) each month to calculate the Performance Adjustment Factor in accordance with the procedures in Section B2.2.4 (Calculation of Performance-Based Monthly Support Fee Adjustments). Contractor shall attach completed versions of these tables to each invoice. The SFMTA will review these calculations before paying Contractor’s invoice.

Table 7: Calculation of Performance Adjustment Factor				
	Column A	Column B	Column C	Column D
Row	Parameter	Performance Score	Weight	Weighted Performance Score
1	Availability		× 4% =	
2	Reduction in Operating Margin Events		× 4% =	
3	Loss of Critical Function		× 2% =	
4	Unsatisfactory Issues Tally		× 10% =	
5	Sum of Weighted Performance Scores			
6	Add monthly fixed fee			+ 80%
7	Performance Adjustment Factor			

B2.2.5 Calculation of Phase-in Adjustments. The System will be implemented in Phases, as described in Contract Specifications, Section 8 (Deployment, Migration and Acceptance). The Support Services that Contractor will provide during a Deployment Phase will begin at the end of that Phase’s Warranty Period. Until Final Acceptance, the Monthly Support Fee will be pro-rated according to Appendix B2 (Calculation of Charges), Table 8 to account for the fact that the SFMTA will not receive Support Services for the portions of the System that the SFMTA has not yet accepted.

B2.2.5.1 Calculation of Phase-in Adjustment Factor. To calculate the Phase-in Adjustment Factor, the Contractor shall add the corresponding Phase-in Adjustment Percentage from Appendix B2 (Calculation of Charges), Table 8 for each of the Phases which the SFMTA has given Conditional Acceptance.

B2.2.5.2 Sunset of Phase-in Adjustment Factor. Starting on the first of the month after Final Acceptance, the Phase-in Adjustment Factor will no longer be calculated and is instead set at 100%.

Table 8: Support Payment Schedule for Phased Delivery	
Phase	Phase-In Adjustment Percentage
1. Pilot Phase & Subway Replacement	50%
2. N Expansion	10%
3. T Expansion	10%
4. K&M Expansions	10%
5. J Expansion	10%
6. L Expansion	10%
TOTAL ALL PHASES	100%

B2.3 General Procedures

B2.3.1 Economic Price Adjustment. SFMTA will make certain adjustments to the Contractor compensation, in accordance with the terms of this Section B2.3.1 (Economic Price Adjustment), below. Price adjustments will apply to:

- a. System Procurement Price Schedule line items listed in Appendix B1 (Schedule of Prices), Table 1, line items 5 – 10.
- b. Pricing for Options listed in Appendix B1 (Schedule of Prices), Table 2, all line items.
- c. System Support prices, listed in Appendix B1 (Schedule of Prices), Table 3, line items 1 -3.
- d. Hourly rates for labor, listed in Appendix B2 (Calculation of Charges), Table 4, all line items
- e. Spare part prices, listed in Appendix B2 (Calculation of Charges), Table 5, all line items.
- f. Liquidated damages, as specified in Section 5.8.4 (Liquidated Damages for Unauthorized Replacement of Key Personnel), 5.18.9 (Liquidated Damages for Transit Service Interruption) through 5.18.11 (Liquidated Damages for Late Delivery).

B2.3.1.1 Sole Remedy for Cost Increases. An economic price adjustment under this Section shall be Contractor's sole remedy for any increases in Contractor's costs arising from or related to economic inflation.

B2.3.1.2 Adjustment Timing

B2.3.1.2.1 System Procurement Price Schedule line items listed in Appendix B1 (Schedule of Prices), Table 1 items 1 – 4 shall not be adjusted.

B2.3.1.2.2 System Procurement Price Schedule line items listed in Appendix B1 (Schedule of Prices), Table 1 items 5 - 10 will be adjusted only once upon commencement of the associated Deployment Phase.

B2.3.1.2.3 Prices for the Options listed in Appendix B1 (Schedule of Prices), Table 2, will be adjusted only once, at the SFMTA issuance of notice of intent to exercise the Option, if that exercise occurs more than three years from Notice to Proceed, in accordance with the price adjustments set out in this Appendix.

B2.3.1.2.4 System Support prices, including prices of Options, listed in Appendix B1 (Schedule of Prices), Table 3, will be adjusted once upon commencement of the support, and will be adjusted yearly thereafter on the anniversary date of the commencement of the Support period.

B2.3.1.2.5 Hourly rates for labor listed in Appendix B1 (Schedule of Prices), Table 4, will be adjusted once per Fiscal Year.

B2.3.1.2.6 Spare part prices, listed in Appendix B1 (Schedule of Prices), Table 5, will be adjusted once upon commencement of the support, and will be adjusted yearly thereafter on the anniversary date of the commencement of the Support period.

B2.3.1.2.7 The Liquidated Damages amounts in Sections 5.8.4 (Liquidated Damages for Unauthorized Replacement of Key Personnel), 5.18.9 (Liquidated Damages for Transit Service Interruption) through 5.18.11 (Liquidated Damages for Late Delivery) shall be adjusted when and at the same rate as the prices identified in Section B2.3.1 (Economic Price Adjustment) are adjusted.

B2.3.1.3 Economic Price Adjustment Calculation. The SFMTA will calculate adjustment to prices for unforeseen market or labor conditions using the North American Industry Classification System (NAICS) labor and material indices published by the U.S. Department of Labor, Bureau of Labor Statistics (BLS). These indices may be found at:

- a. <https://www.bls.gov/iag/tgs/iag334.htm>,
- b. www.bls.gov/iag/tgs/iag335.htm,
- c. www.bls.gov/iag/tgs/iag336.htm, and
- d. <https://www.bls.gov/iag/tgs/iag54.htm>.

B2.3.1.3.1 Labor Indices. The SFMTA will calculate adjustment to prices for changing labor conditions using the average of following indices, equally weighted:

- a. Series CEU3133500003 – Average hourly earnings of all employees index for the NAICS Manufacturing Series, Code 335, Electrical Equipment, Appliance and Component Manufacturing,
- b. Series CEU3133600003 – Average hourly earnings of all employees index for the NAICS Manufacturing Series, Code 336, Transportation Equipment, and
- c. Series CEU6054000003 – Average hourly earnings of all employees index for the NAICS Manufacturing Series, Code 541, Professional, Scientific, and Technical Services.

B2.3.1.3.2 Material Indices. The SFMTA will calculate adjustment to prices for changing market conditions using:

- a. Series PCU334419334419 – Producer Price Index (PPI) for the NAICS Manufacturing Series, Code 3344, Semiconductor and Other Electronic Component Manufacturing,
- b. Series PCU335---335--- – Producer Price Index (PPI) for the NAICS Manufacturing Series, Code 335, Electrical Equipment, Appliance and Component Manufacturing, and
- c. Series PCU336---336--- – Producer Price Index (PPI) for the NAICS Manufacturing Series, Code 336, Transportation Equipment.

B2.3.1.3.3 Determination of Adjustment Factor

B2.3.1.3.3.1 The adjustment factor is the ratio of the current index to the base index. There are two adjustment factors, a labor adjustment factor and a material adjustment factor.

B2.3.1.3.3.2 SFMTA will determine the base labor and material indices by calculating the arithmetic mean (average) of the final published indices referenced above for the three months prior to the date of Notice to Proceed.

B2.3.1.3.3.3 SFMTA will determine the current labor and material indices by calculating the arithmetic mean of the final published indices referenced above for the three months prior to the date of adjustment.

B2.3.1.3.4 Determination of Adjusted Price

B2.3.1.3.4.1 SFMTA will use the Contract Amount stated for Work not yet performed (excluding the sum prices for all Contract Modifications and Work delayed by Contractor) stated in Table 1 (System Procurement Price Schedule) of Appendix B1 (Calculation of Charges) as the basis for adjustment.

B2.3.1.3.4.2 System Procurement Prices

B2.3.1.3.4.2.1. Appendix B1 (Schedule of Prices), Table 1 states the labor and material prices for each System Procurement Price Schedule line item to be adjusted.

B2.3.1.3.4.2.2. SFMTA will adjust the labor price for each System Procurement Price Schedule line item by multiplying the price by the labor adjustment factor.

B2.3.1.3.4.2.3. SFMTA will adjust the material price for each System Procurement Price Schedule line item by multiplying the price by the material adjustment factor.

B2.3.1.3.4.2.4. SFMTA will add the adjusted labor and material prices together to produce the adjusted total price.

B2.3.1.3.4.2.5. SFMTA will modify Appendix B1 (Schedule of Prices), Table 1 with the adjusted labor, material and total prices for each line item, as applicable.

B2.3.1.3.4.2.6. SFMTA will modify the “Milestone Payment” column in Appendix C (Milestone Schedule and Payment) with the adjusted total price from Appendix B1 (Schedule of Prices), Table 1 (corresponding to 100%), and with recalculated values for each of the subordinate Milestones based on the percentages of that total price specified in Appendix C, for each phase to be adjusted.

B2.3.1.3.4.2.7. No Milestone or Phase will be adjusted beyond the date committed to in Appendix C (Milestone Schedule and Payment). If Contractor delays the Work causing delay to completion of a Milestone, Project completion date, or other deadline tied to compensation, SFMTA will apply the adjustment using the dates stated in Appendix C (that is, excluding the period(s) of delay).

B2.3.1.3.4.3 Prices for Options listed in Appendix B1, Table 2. SFMTA will adjust the material price for each Option by the ratio of current material indices to base material indices applicable when the SFMTA issues notice of intent to exercise the Option.

B2.3.1.3.4.4 System Support Prices, including Options, listed in Appendix B1, Table 3.

B2.3.1.3.4.4.1. SFMTA will use the monthly support fee from the “Original Monthly Support Fee” column in Appendix B1 (Schedule of Prices), Table 3 for this calculation.

B2.3.1.3.4.4.2. The monthly support fee will be broken down by the percentages of labor and material as follows: 40% labor and 60% material.

B2.3.1.3.4.4.3. SFMTA will adjust the labor portion for the monthly support fee by multiplying the labor portion of the monthly support fee by the labor adjustment factor.

B2.3.1.3.4.4.4. SFMTA will adjust the material portion for the monthly support fee by multiplying the material portion of the monthly support fee by the material adjustment factor.

B2.3.1.3.4.4.5. SFMTA will add the adjusted labor and material fees together to produce the adjusted total monthly support fee.

B2.3.1.3.4.4.6. SFMTA will modify the “Adjusted Monthly Support Fee” column in Appendix B1 (Schedule of Prices), Table 3 with the adjusted total monthly support fee. SFMTA will not modify the “Original Monthly Support Fee” column.

B2.3.1.3.4.5 Hourly Rates for Labor listed in Appendix B1 (Schedule of Prices), Table 4. Each June, SFMTA will calculate and publish the labor adjustment factor to be used for the following Fiscal Year. When providing a Proposal in response to an SFMTA request, Contractor shall adjust the hourly rates by multiplying the labor hourly rates by the most recent labor adjustment factor published by SFMTA and include this calculation in the Proposal. The adjusted hourly rates shall be used to calculate the Contract Modification price.

B2.3.1.3.4.6 Spare Part Prices listed in Appendix B1 (Schedule of Prices), Table 5. Each June, SFMTA will publish the material adjustment factor to be used for the following Fiscal Year. When invoicing the SFMTA for Reimbursable Parts, Contractor shall adjust the spare part prices by multiplying the prices by the most recently published material adjustment factor as of the invoice date and include this calculation in the invoice. The adjusted prices shall be used to calculate the reimbursement.

B2.3.1.3.4.7 Liquidated Damages. The Liquidated Damages specified in General Provisions Section 5.18.9 through 5.18.11 (Liquidated Damages for Late Delivery) shall be adjusted by multiplying the liquidated damages amounts by the most recent labor adjustment factor calculated by SFMTA.

B2.3.1.4 Limit of Adjustments

B2.3.1.4.1 Annual Economic Price Adjustment Cap. The cumulative price adjustments shall not exceed a compounded average increase or decrease of 6 percent per year (calculated relative to the prices stated in the Agreement for the immediately preceding year).

B2.3.1.5 Adjustment Procedure.

B2.3.1.5.1 Requests. Economic Price Adjustments will occur according to the adjustment timing in Section B2.3.1.2 (Adjustment Timing). The SFMTA will calculate the price adjustments using the procedures in Section B2.3.1.3 (Economic Price Adjustment Calculation).

B2.3.1.5.2 Contract Modification. Adjustment of prices and adjustment of liquidated damages shall be stated in a Contract Modification executed by the

Parties, as described in General Provisions, Section 12.5 (Contract Modifications and Change Orders).

B2.3.1.5.3 Exchange Rate Risk. The City will not make economic adjustments to Contractor compensation to adjust for losses from fluctuations in the value of foreign currencies in relation to the United States Dollar.

Appendix C
Milestone Schedule and Payment

Note: Major Milestones are indicated in **bold** in the following Table and by “MM” in the corresponding row. Refer to Section B2.1.1 (Payment Procedures) for more details.

Milestone payments in phases marked with (*) will be adjusted in accordance with Appendix B2.3.2. Prices listed below are subject to 5% payment reduction for Retention, as provided in General Provisions, Section 4.5.3.

The schedule included below in the “Days from NTP” column is the deadline for Contractor to complete the Work and/or submit Deliverables constituting the listed Milestone and does not correspond to the date Contractor can expect to be paid for that Milestone. SFMTA will pay the Contractor for each Milestone as described in Section B2.1.1 (Payment Procedures) of Appendix B2.

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
1. System design					100%	\$43,233,884
1	1	MM	Submittal of Interim Project Schedule	15	5%	\$2,161,694
1	2	MM	Completion of all Work necessary for approval of Conceptual Design	30	10%	\$4,323,388
1	3	MM	Submittal of Project Management Plan	30	10%	\$4,323,388
1	4		Submittal of Project Schedule	90	10%	\$4,323,388
1	5	MM	Completion of all Work necessary for approval of Preliminary Design	231	15%	\$6,485,083
1	6	MM	Completion of all Work necessary for approval of Final System Design	497	30%	\$12,970,165
1	7		First Article Configuration Inspection	903	20%	\$8,646,777
2. Central Equipment, simulators, tools, documentation, and training					100%	\$18,025,207
2	1	MM	Delivery of all primary Central Control Equipment	917	25%	\$4,506,302
2	2	MM	Delivery of all secondary Central Control Equipment	917	25%	\$4,506,302
2	3		Delivery of all simulators	1037	15%	\$2,703,781
2	4	MM	Delivery of initial operations and maintenance training (Pilot Phase)	1281	5%	\$901,260

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
2	5		Delivery of follow-up operations and maintenance training (Subway Replacement Phase)	1862	10%	\$1,802,521
2	6		Delivery of final operations and maintenance training (Entire System)	3296	10%	\$1,802,521
2	7		Delivery of all SLMDs and tools necessary for maintenance	1043	10%	\$1,802,521
3. Onboard Equipment fitting					100%	\$18,127,571
3	1		Successful static test of first equipped train in the test track	799	20%	\$3,625,514
3	2	MM	Completion of all Work necessary for SFMTA Acceptance of first 20 cars	1167	10%	\$1,812,757
3	3		Delivery of all Equipment and Materials necessary for all 219 cars	1651	30%	\$5,438,271
3	4		Completion of all Work necessary for SFMTA Acceptance of all 219 cars	1862	30%	\$5,438,271
3	5		Successful operation of historic and non-revenue vehicles on the CBTC System	1862	10%	\$1,812,757
4. Pilot phase					100%	\$23,447,108
4	1	MM	Completion of all Work necessary for approval of Pilot Phase Construction Final Design	672	10%	\$2,344,711
4	2		Pilot FAT completed successfully	1055	10%	\$2,344,711
4	3		All Pilot Phase Equipment delivered	896	10%	\$2,344,711
4	4		All Pilot Phase static site acceptance tests completed	1139	10%	\$2,344,711
4	5	MM	All Pilot Phase dynamic site acceptance tests completed	1253	10%	\$2,344,711
4	6	MM	Completion of all Work necessary for SFMTA approval to begin Pilot Revenue Service	1281	30%	\$7,034,132
4	7		Completion of all Work identified in the Pilot Comment Period	1862	15%	\$3,517,066
4	8	MM	Completion of all Work necessary for Pilot Conditional Acceptance (following	2407	5%	\$1,172,355

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
			successful completion of Warranty Period)			
5. Subway Replacement*					100%	\$17,303,349
5	1	MM	Completion of all Work necessary for approval of Subway Replacement Phase Construction Final Design	966	10%	\$1,730,335
5	2		Subway Replacement FAT completed successfully	1485	10%	\$1,730,335
5	3		All Subway Replacement Phase Equipment delivered	1276	10%	\$1,730,335
5	4		All Subway Replacement Phase static site acceptance tests completed	1541	10%	\$1,730,335
5	5	MM	All Subway Replacement Phase dynamic site acceptance tests completed	1834	10%	\$1,730,335
5	6	MM	SFMTA approval to begin Subway Revenue Service (Subway Cutover)	1862	25%	\$4,325,837
5	7	MM	Completion of all Work necessary for Subway Conditional Acceptance (following successful completion of Warranty Period)	2407	20%	\$3,460,670
5	8		Successful removal of all legacy ATCS equipment from vehicles	1818	5%	\$865,167
6. N Expansion*					100%	\$7,484,939
6	1	MM	Completion of all Work necessary for approval of N Expansion Phase Construction Final Design	1204	20%	\$1,496,988
6	2		N Expansion Replacement FAT completed successfully	1821	10%	\$748,494
6	3		All N Expansion Phase Equipment delivered	1542	15%	\$1,122,741
6	4		All N Expansion Phase static site acceptance tests completed	1877	10%	\$748,494
6	5		All N Expansion Phase dynamic site acceptance tests completed	2002	15%	\$1,122,741

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
6	6	MM	Completion of all Work necessary for SFMTA approval to begin N expansion Revenue Service	2030	10%	\$748,494
6	7	MM	Completion of all Work necessary for N Expansion Conditional Acceptance	2575	20%	\$1,496,988
7. T Expansion*					100%	\$7,391,297
7	1	MM	Completion of all Work necessary for approval of T Expansion Phase Construction Final Design	1456	20%	\$1,478,259
7	2		T Expansion FAT completed successfully	1821	10%	\$739,130
7	3		All T Expansion Phase Equipment delivered	1864	15%	\$1,108,695
7	4		All T Expansion Phase static site acceptance tests completed	2030	10%	\$739,130
7	5		All T Expansion Phase dynamic site acceptance tests completed	2142	15%	\$1,108,695
7	6	MM	Completion of all Work necessary for SFMTA approval to begin T expansion Revenue Service	2198	10%	\$739,130
7	7	MM	Completion of all Work necessary for T Expansion Conditional Acceptance	2743	20%	\$1,478,259
8. K&M Expansions*					100%	\$8,254,099
8	1	MM	Completion of all Work necessary for approval of K&M Expansion Phase Construction Final Design	1708	20%	\$1,650,820
8	2		K&M Expansion FAT completed successfully	2114	10%	\$825,410
8	3		All K&M Expansion Phase Equipment delivered	2018	15%	\$1,238,115
8	4		All K&M Expansion Phase static site acceptance tests completed	2198	10%	\$825,410
8	5		All K&M Expansion Phase dynamic site acceptance tests completed	2331	15%	\$1,238,115

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
8	6	MM	Completion of all Work necessary for SFMTA approval to begin K&M expansion Revenue Service	2366	10%	\$825,410
8	7	MM	Completion of all Work necessary for K&M Expansion Conditional Acceptance	2911	20%	\$1,650,820
9. J Expansion*					100%	\$3,931,892
9	1	MM	Completion of all Work necessary for approval of J Expansion Phase Construction Final Design	1960	20%	\$786,378
9	2		J Expansion FAT completed successfully	2282	10%	\$393,189
9	3		All J Expansion Phase Equipment delivered	2228	15%	\$589,784
9	4		All J Expansion Phase static site acceptance tests completed	2359	10%	\$393,189
9	5		All J Expansion Phase dynamic site acceptance tests completed	2499	15%	\$589,784
9	6	MM	Completion of all Work necessary for SFMTA approval to begin J expansion Revenue Service	2534	10%	\$393,189
9	7	MM	Completion of all Work necessary for J Expansion Conditional Acceptance	3079	20%	\$786,378
10. L Expansion*					100%	\$4,315,089
10	1	MM	Completion of all Work necessary for approval of L Expansion Phase Construction Final Design	2212	20%	\$863,018
10	2		L Expansion FAT completed successfully	2527	10%	\$431,509
10	3		All L Expansion Phase Equipment delivered	2452	15%	\$647,263
10	4		All L Expansion Phase static site acceptance tests completed	2583	10%	\$431,509
10	5		All L Expansion Phase dynamic site acceptance tests completed	2709	15%	\$647,263

Phase	No	MM	Milestone	Days From NTP	% of Phase Price	Milestone Payment
10	6	MM	Completion of all Work necessary for SFMTA approval to begin L expansion Revenue Service	2751	10%	\$431,509
10	7	MM	Completion of all Work necessary for L Expansion Conditional Acceptance	3296	20%	\$863,018

Appendix D Contract Schedule

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	Year																							
								H2	2025 H1	2025 H2	2026 H1	2026 H2	2027 H1	2027 H2	2028 H1	2028 H2	2029 H1	2029 H2	2030 H1	2030 H2	2031 H1	2031 H2	2032 H1	2032 H2	2033 H1	2033 H2	2034 H1	2034 H2			
1	TCUP-1	SFMTA TCU Project schedule	2355 days	1/15/2025	1/24/2034	0	108																								
2	TCUP-2	Milestones	2355 days	1/15/2025	1/24/2034	0	108																								
3	TCUP-3	Project Contractual Milestones	2343 days	1/30/2025	1/24/2034	0	108																								
4	TCUP-4	1.1 Submittal of Interim Project Schedule (30 Jan 25)	0 days	1/30/2025	1/30/2025	0	0																								
5	TCUP-5	1.2 Completion of all Work necessary for approval of Conceptual Design (14 Feb 25)	0 days	2/14/2025	2/14/2025	1	1																								
6	TCUP-6	1.3 Submittal of Project Management Plan (14 Feb 25)	0 days	2/14/2025	2/14/2025	1	1																								
7	TCUP-7	1.4 Submittal of Project Schedule	0 days	4/15/2025	4/15/2025	3	3																								
8	TCUP-8	1.5 Completion of all Work necessary for approval of Preliminary Design (3 Sep 25)	0 days	9/3/2025	9/3/2025	8	8																								
9	TCUP-9	1.6 Completion of all Work necessary for approval of Final System Design (27 May 26)	0 days	5/27/2026	5/27/2026	16	16																								
10	TCUP-10	1.7 First Article Configuration Inspection	0 days	7/7/2027	7/7/2027	30	30																								
11	TCUP-11	2.1 Delivery of all primary Central Control Equipment (21 Jul 27)	0 days	7/21/2027	7/21/2027	30	30																								
12	TCUP-12	2.2 Delivery of all secondary Central Control Equipment (21 Jul 27)	0 days	7/21/2027	7/21/2027	30	30																								
13	TCUP-13	2.3 Delivery of all simulators	0 days	11/18/2027	11/18/2027	34	34																								
14	TCUP-14	2.4 Delivery of initial operations and maintenance training (Pilot phase)	0 days	8/3/2026	8/3/2026	19	19																								
15	TCUP-15	2.5 Delivery of follow up operations and maintenance training (Subway Replacement Phase)	0 days	12/21/2026	12/21/2026	23	23																								
16	TCUP-16	2.6 Delivery of final operations and maintenance training (Entire System)	0 days	7/14/2032	7/14/2032	90	90																								
17	TCUP-17	2.7 Delivery of all SLMDs and tools necessary for maintenance	0 days	11/24/2027	11/24/2027	34	34																								
18	TCUP-18	3.1 Successful static test of first equipped train in the test track	0 days	3/25/2027	3/25/2027	26	26																								
19	TCUP-19	3.2 Completion of all Work necessary for SFMTA Acceptance of first 20 cars	0 days	3/27/2028	3/27/2028	38	38																								
20	TCUP-20	3.3 Delivery of all Equipment and Materials necessary for all 219 cars	0 days	7/24/2029	7/24/2029	54	54																								
21	TCUP-21	3.4 Completion of all Work necessary for SFMTA Acceptance of all 219 cars (20 Feb 30)	0 days	2/20/2030	2/20/2030	61	61																								
22	TCUP-22	3.5 Successful operation of historic and non-revenue vehicles on the CBTC System (20 Feb 30)	0 days	2/20/2030	2/20/2030	61	61																								
23	TCUP-23	4.1 Completion of all Work necessary for approval of Pilot Phase Construction Final Design (18 Nov 26)	0 days	11/18/2026	11/18/2026	22	22																								
24	TCUP-24	4.2 Pilot FAT completed successfully	0 days	12/6/2027	12/6/2027	35	35																								
25	TCUP-25	4.3 All Pilot Phase Equipment delivered	0 days	6/30/2027	6/30/2027	29	29																								
26	TCUP-26	4.4 All Pilot Phase static site acceptance tests completed	0 days	2/28/2028	2/28/2028	37	37																								
27	TCUP-27	4.5 All Pilot Phase dynamic site acceptance tests completed (21 Jun 28)	0 days	6/21/2028	6/21/2028	41	41																								
28	TCUP-28	4.6 Completion of all Work necessary for SFMTA approval to begin Pilot Revenue Service (19 Jul 28)	0 days	7/19/2028	7/19/2028	42	42																								
29	TCUP-29	4.7 Completion of all Work identified in the Pilot Comment Period	0 days	2/20/2030	2/20/2030	61	61																								
30	TCUP-30	4.8 Completion of all Work necessary for Pilot Conditional Acceptance (following successful completion of Warranty Period) (19 Aug 31)	0 days	8/19/2031	8/19/2031	79	79																								
31	TCUP-31	5.1 Completion of all Work necessary for approval of Subway Replacement Phase Construction Final Design (8 Sep 27)	0 days	9/8/2027	9/8/2027	32	32																								
32	TCUP-32	5.2 Subway Replacement FAT completed successfully	0 days	2/8/2029	2/8/2029	49	49																								
33	TCUP-33	5.3 All Subway Replacement Phase Equipment delivered	0 days	7/14/2028	7/14/2028	42	42																								
34	TCUP-34	5.4 All Subway Replacement Phase static site acceptance tests completed	0 days	4/5/2029	4/5/2029	51	51																								
35	TCUP-35	5.5 All Subway Replacement Phase dynamic site acceptance tests completed (23 Jan 30)	0 days	1/23/2030	1/23/2030	60	60																								
36	TCUP-36	5.6 SFMTA approval to begin Subway Revenue Service (Subway Cutover) (20 Feb 30)	0 days	2/20/2030	2/20/2030	61	61																								
37	TCUP-37	5.7 Completion of all Work necessary for Subway Conditional Acceptance (following successful completion of Warranty Period) (19 Aug 31)	0 days	8/19/2031	8/19/2031	79	79																								
38	TCUP-38	5.8 Successful removal of all legacy ATCS equipment from vehicles	0 days	1/7/2030	1/7/2030	60	60																								

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
39	TCUP-39	6.1 Completion of all Work necessary for approval of N Expansion Phase Construction Final Design (3 May 28)	0 days	5/3/2028	5/3/2028	40	40																					
40	TCUP-40	6.2 N Expansion Replacement FAT completed successfully	0 days	1/10/2030	1/10/2030	60	60																					
41	TCUP-41	6.3 All N Expansion Phase Equipment delivered	0 days	4/6/2029	4/6/2029	51	51																					
42	TCUP-42	6.4 All N Expansion Phase static site acceptance tests completed	0 days	3/7/2030	3/7/2030	62	62																					
43	TCUP-43	6.5 All N Expansion Phase dynamic site acceptance tests completed	0 days	7/10/2030	7/10/2030	66	66																					
44	TCUP-44	6.6 Completion of all Work necessary for SFMTA approval to begin N expansion Revenue Service (7 Aug 30)	0 days	8/7/2030	8/7/2030	67	67																					
45	ICUP-45	6.7 Completion of all Work necessary for N Expansion Conditional Acceptance (3 Feb 32)	0 days	2/3/2032	2/3/2032	85	85																					
46	TCUP-46	7.1 Completion of all Work necessary for approval of T Expansion Phase Construction Final Design (10 Jan 29)	0 days	1/10/2029	1/10/2029	48	48																					
47	TCUP-47	7.2 T Expansion FAT completed successfully	0 days	1/10/2030	1/10/2030	60	60																					
48	TCUP-48	7.3 All T Expansion Phase Equipment delivered	0 days	2/22/2030	2/22/2030	61	61																					
49	TCUP-49	7.4 All T Expansion Phase static site acceptance tests completed	0 days	8/7/2030	8/7/2030	67	67																					
50	TCUP-50	7.5 All T Expansion Phase dynamic site acceptance tests completed	0 days	11/27/2030	11/27/2030	70	70																					
51	TCUP-51	7.6 Completion of all Work necessary for SFMTA approval to begin T expansion Revenue Service (22 Jan 31)	0 days	1/22/2031	1/22/2031	72	72																					
52	ICUP-52	7.7 Completion of all Work necessary for T Expansion Conditional Acceptance (20 Jul 32)	0 days	7/20/2032	7/20/2032	90	90																					
53	TCUP-53	8.1 Completion of all Work necessary for approval of K&M Expansion Phase Construction Final Design (19 Sep 29)	0 days	9/19/2029	9/19/2029	56	56																					
54	TCUP-54	8.2 K&M Expansion FAT completed successfully	0 days	10/30/2030	10/30/2030	70	70																					
55	TCUP-55	8.3 All K&M Expansion Phase Equipment delivered	0 days	7/26/2030	7/26/2030	66	66																					
56	TCUP-56	8.4 All K&M Expansion Phase static site acceptance tests completed	0 days	1/22/2031	1/22/2031	72	72																					
57	TCUP-57	8.5 All K&M Expansion Phase dynamic site acceptance tests completed	0 days	6/4/2031	6/4/2031	77	77																					
58	TCUP-58	8.6 Completion of all Work necessary for SFMTA approval to begin K&M expansion Revenue Service (9 Jul 31)	0 days	7/9/2031	7/9/2031	78	78																					
59	ICUP-59	8.7 Completion of all Work necessary for K&M Expansion Conditional Acceptance (4 Jan 33)	0 days	1/4/2033	1/4/2033	96	96																					
60	TCUP-60	9.1 Completion of all Work necessary for approval of J Expansion Phase Construction Final Design (29 May 30)	0 days	5/29/2030	5/29/2030	64	64																					
61	TCUP-61	9.2 J Expansion FAT completed successfully	0 days	4/16/2031	4/16/2031	75	75																					
62	TCUP-62	9.3 All J Expansion Phase Equipment delivered	0 days	2/21/2031	2/21/2031	73	73																					
63	TCUP-63	9.4 All J Expansion Phase static site acceptance tests completed	0 days	7/2/2031	7/2/2031	78	78																					
64	TCUP-64	9.5 All J Expansion Phase dynamic site acceptance tests completed	0 days	11/19/2031	11/19/2031	82	82																					
65	TCUP-65	9.6 Completion of all Work necessary for SFMTA approval to begin J expansion Revenue Service (24 Dec 31)	0 days	12/24/2031	12/24/2031	83	83																					
66	TCUP-66	9.7 Completion of all Work necessary for J Expansion Conditional Acceptance (21 Jun 33)	0 days	6/21/2033	6/21/2033	101	101																					
67	TCUP-67	10.1 Completion of all Work necessary for Approval of L Expansion Phase Construction Final Design (5 Feb 31)	0 days	2/5/2031	2/5/2031	73	73																					
68	TCUP-68	10.2 L Expansion FAT completed successfully	0 days	12/17/2031	12/17/2031	83	83																					
69	TCUP-69	10.3 All L Expansion Phase Equipment delivered	0 days	10/3/2031	10/3/2031	81	81																					
70	TCUP-70	10.4 All L Expansion Phase static site acceptance tests completed	0 days	2/11/2032	2/11/2032	85	85																					
71	TCUP-71	10.5 All L Expansion Phase dynamic site acceptance tests completed	0 days	6/16/2032	6/16/2032	89	89																					
72	TCUP-72	10.6 Completion of all Work necessary for SFMTA approval to begin L expansion Revenue Service (28 Jul 32)	0 days	7/28/2032	7/28/2032	90	90																					
73	ICUP-73	10.7 Completion of all Work necessary for L Expansion Conditional Acceptance (24 Jan 34)	0 days	1/24/2034	1/24/2034	108	108																					

Task Summary Critical Progress



ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025		2026		2027		2028		2029		2030		2031		2032		2033		2034			
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1
120	TCUP-120	Site access for testing	1215 days	9/23/2027	5/19/2032	32	88																						
121	TCUP-121	Pilot Pre-Testing	60 days	9/23/2027	12/15/2027	32	35																						
122	TCUP-122	Pilot	140 days	9/23/2027	4/5/2028	32	39																						
123	TCUP-123	Subway	160 days	2/9/2029	9/20/2029	49	56																						
124	TCUP-124	N-expansion	110 days	1/11/2030	6/13/2030	60	65																						
125	TCUP-125	T-Expansion	120 days	6/13/2030	11/27/2030	65	70																						
126	TCUP-126	K&M Expansion	115 days	11/28/2030	5/11/2031	70	76																						
127	TCUP-127	J Expansion	120 days	5/8/2031	10/22/2031	76	81																						
128	TCUP-128	L Expansion	110 days	12/18/2031	5/19/2032	83	88																						
129	TCUP-129	1-System Design	879 days	1/15/2025	5/29/2028	0	40																						
130	TCUP-130	Program reviews	542 days	1/15/2025	2/12/2027	0	25																						
131	TCUP-131	Kick off Meeting	1 day	1/22/2025	1/22/2025	0	0																						
132	TCUP-132	Technical kick off meeting	1 day	2/20/2025	2/20/2025	1	1																						
133	TCUP-133	Sustainability kick off meeting	1 day	2/26/2025	2/26/2025	1	1																						
134	TCUP-134	Contract schedule review	1 day	4/9/2025	4/9/2025	3	3																						
135	TCUP-135	Design	393 days	2/12/2025	8/14/2026	1	19																						
136	TCUP-136	Conceptual design and project organization	2 days	2/12/2025	2/13/2025	1	1																						
137	TCUP-137	Preliminary Design Review	3 days	7/16/2025	7/18/2025	6	6																						
138	TCUP-138	Final Design Review	2 days	5/13/2026	5/14/2026	16	16																						
139	TCUP-139	Installation Design Review	2 days	8/13/2026	8/14/2026	19	19																						
140	TCUP-140	Deployment	542 days	1/15/2025	2/12/2027	0	25																						
141	TCUP-141	Site activities kick off meeting	1 day	1/15/2025	1/15/2025	0	0																						
142	TCUP-142	Train deployment activities kick off meeting	1 day	2/11/2027	2/12/2027	25	25																						
143	TCUP-143	Project Start up activities	90 days	1/15/2025	5/20/2025	0	4																						
144	TCUP-144	Pilot Reliability, Availability, Maintainability, Safety	654 days	1/15/2025	7/19/2027	0	30																						
145	TCUP-145	Safety Studies	190 days	1/15/2025	10/7/2025	0	9																						
146	TCUP-146	P&S - PDR Safety Documentation	80 days	1/15/2025	5/6/2025	0	4																						
147	TCUP-147	R&A - PDR Safety Documentation	20 days	5/7/2025	6/3/2025	4	5																						
148	TCUP-148	P&S - FDR Safety Design Documentation	30 days	7/16/2025	8/26/2025	6	7																						
149	TCUP-149	R&A - FDR Safety	30 days	8/27/2025	10/7/2025	7	9																						
150	TCUP-150	SWB#01 Design + Partial Operational Safety Case	40 days	5/25/2027	7/19/2027	28	30																						
151	TCUP-151	Safety Case - Prepare & Submit	20 days	5/25/2027	6/21/2027	28	29																						
152	TCUP-152	Safety Case - Client / ISA Approval	20 days	6/22/2027	7/19/2027	29	30																						
153	TCUP-153	RAM Studies	180 days	1/15/2025	9/23/2025	0	8																						
154	TCUP-154	P&S PDR RAM Design Documentation	80 days	1/15/2025	5/6/2025	0	4																						
155	TCUP-155	R&A PDR RAM Design Documentation	20 days	5/7/2025	6/3/2025	4	5																						
156	TCUP-156	P&S FDR RAM Design Documentation	30 days	7/16/2025	8/26/2025	6	7																						
157	TCUP-157	R&A FDR RAM Design Documentation	20 days	8/27/2025	9/23/2025	7	8																						
158	TCUP-158	Pilot Solution Engineering	879 days	1/15/2025	5/29/2028	0	40																						
159	TCUP-159	System Design	260 days	1/15/2025	1/13/2026	0	12																						
160	TCUP-160	Pilot - Conceptual Design	20 days	1/15/2025	2/11/2025	0	1																						
161	TCUP-161	Prepare and Submit Conceptual Design	20 days	1/15/2025	2/11/2025	0	1																						
162	TCUP-162	Pilot - System Design Preliminary Design Review (PDR)	130 days	1/15/2025	7/15/2025	0	6																						
163	TCUP-163	P&S - PDR Design Documentation	5 mons	1/15/2025	6/3/2025	0	5																						
164	TCUP-164	R&A - PDR Design Documentation	30 days	6/4/2025	7/15/2025	5	6																						
165	TCUP-165	Pilot-System Design Final Design Review (FDR)	130 days	7/16/2025	1/13/2026	6	12																						
166	TCUP-166	P&S - FDR System Design Documentation	5 mons	7/16/2025	12/2/2025	6	11																						
167	TCUP-167	R&A - FDR - System Design Documentation	30 days	12/3/2025	1/13/2026	11	12																						
168	TCUP-168	Signalling Design	164 days	1/15/2025	9/1/2025	0	8																						
169	TCUP-169	Pilot - Signaling Design Preliminary Design Review (PDR)	90 days	1/15/2025	5/20/2025	0	4																						
170	TCUP-170	Site Survey	40 days	1/15/2025	3/11/2025	0	2																						

ID	Activity ID	Task Name	Duration	Start	Finish	NTP - Start	NTP + Finish	2025 H2	2025 H1	2026 H2	2026 H1	2027 H2	2027 H1	2028 H2	2028 H1	2029 H2	2029 H1	2030 H2	2030 H1	2031 H2	2031 H1	2032 H2	2032 H1	2033 H2	2033 H1	2034 H2	2034 H1	
171	TCUP-171	P&S PDR Signaling Design Documentation	60 days	1/15/2025	4/8/2025	0	3																					
172	TCUP-172	R&A - PDR - Signaling Design Documentation	30 days	4/9/2025	5/20/2025	3	4																					
173	TCUP-173	Pilot - Signaling Design Final Design Review (FDR)	84 days	5/7/2025	9/1/2025	4	8																					
174	TCUP-174	P&S - FDR Operations Design Documentation	54 days	5/7/2025	7/21/2025	4	6																					
175	TCUP-175	R&A - FDR Operations Design Documentation	30 days	7/22/2025	9/1/2025	6	8																					
176	TCUP-176	Hardware Design	480 days	1/15/2025	11/17/2026	0	22																					
177	TCUP-177	Wayside HW Preliminary Design Review (PDR)	120 days	1/15/2025	7/1/2025	0	5																					
178	TCUP-178	P&S - FDR Wayside HW Design Documentation	90 days	1/15/2025	5/20/2025	0	4																					
179	TCUP-179	R&A - PDR Wayside HW Design Documentation	30 days	5/21/2025	7/1/2025	4	5																					
180	TCUP-180	Wayside HW Final Design Review (FDR)	250 days	5/21/2025	5/5/2026	4	16																					
181	TCUP-181	P&S - FDR Wayside HW Design Documentation	100 days	5/21/2025	10/7/2025	4	9																					
182	TCUP-182	R&A - FDR Wayside HW Design Documentation	30 days	10/8/2025	11/18/2025	9	10																					
183	TCUP-183	P&S - FDR Simulators HW Design Documentation	60 days	10/8/2025	12/30/2025	9	11																					
184	TCUP-184	R&A - FDR Simulators HW Design Documentation	30 days	12/31/2025	2/10/2026	12	13																					
185	TCUP-185	P&S - FDR Special Tools HW Design Documentation	60 days	12/31/2025	3/24/2026	12	14																					
186	TCUP-186	R&A - FDR Special Tools HW Design Documentation	30 days	3/25/2026	5/5/2026	14	16																					
187	TCUP-187	On-Board Preliminary Design Review (PDR)	60 days	1/15/2025	4/8/2025	0	3																					
188	TCUP-188	On board survey	3 days	1/22/2025	1/24/2025	0	0																					
189	TCUP-189	OB-PDR Design Documentation Preparation	30 days	1/15/2025	2/25/2025	0	1																					
190	TCUP-190	OB-PDR - Client Approval	30 days	2/26/2025	4/8/2025	1	3																					
191	TCUP-191	On-Board Final Design Review (FDR)	70 days	2/26/2025	6/3/2025	1	5																					
192	TCUP-192	OB-FDR Design Documentation Preparation	40 days	2/26/2025	4/22/2025	1	3																					
193	TCUP-193	OB-FDR - Client Approval	30 days	4/23/2025	6/3/2025	3	5																					
194	TCUP-194	Hardware Compliance	480 days	1/15/2025	11/17/2026	0	22																					
195	TCUP-195	Stns Signaling Equipment room EMC/EMI environment characterization	1 mon	1/15/2025	2/11/2025	0	1																					
196	TCUP-196	Wayside Studies and compliance testing	18 mons	7/2/2025	11/17/2026	6	22																					
197	TCUP-197	On board Studies and compliance testing	4 mons	4/8/2026	7/28/2026	15	18																					
198	TCUP-198	Software Design	634 days	1/15/2025	6/21/2027	0	29																					
199	TCUP-199	ATS HMI	320 days	1/15/2025	4/7/2026	0	15																					
200	TCUP-200	Specification of ATS HMI	80 days	1/15/2025	5/6/2025	0	4																					
201	TCUP-201	ATS HMI Prototyping	100 days	5/7/2025	9/23/2025	4	8																					
202	TCUP-202	ATS HMI First version	100 days	9/24/2025	2/10/2026	8	13																					
203	TCUP-203	ATS HMI first version demonstration and review	40 days	2/11/2026	4/7/2026	13	15																					
204	TCUP-204	On board HMI	120 days	7/16/2025	12/30/2025	6	11																					
205	TCUP-205	Specification of on board driver display HMI	40 days	7/16/2025	9/9/2025	6	8																					
206	TCUP-206	On board driver display HMI	80 days	9/10/2025	12/30/2025	8	11																					
207	TCUP-207	SWB #0.1 - Pilot, Train Dynamic PICO, basic guideway	444 days	2/12/2025	10/26/2026	1	21																					
208	TCUP-208	SWB # 0.1 - Guideway Database Development	100 days	2/12/2025	7/1/2025	1	5																					
209	TCUP-209	SWB # 0.1 - SW Development	150 days	8/5/2025	3/2/2026	7	14																					
210	TCUP-210	SWB # 0.1 - Informal FAT (Dry Run FAT)	100 days	3/3/2026	7/20/2026	14	18																					
211	TCUP-211	SWB # 0.1 - Factory Acceptance Test (FAT)	50 days	7/21/2026	9/28/2026	18	20																					
212	TCUP-212	SWB # 0.1 - Safety Appraisal	20 days	9/29/2026	10/26/2026	20	21																					
213	TCUP-213	SWB # 1.0 - Pilot, candidate for FAT/SAT	340 days	3/3/2026	6/21/2027	14	29																					
214	TCUP-214	SWB # 1.0 - SW Development	160 days	3/3/2026	10/12/2026	14	21																					
215	TCUP-215	SWB # 1.0 - Informal FAT (Dry Run FAT)	80 days	10/13/2026	2/1/2027	21	25																					
216	TCUP-216	SWB # 1.0 - Factory Acceptance Test (FAT)	50 days	2/2/2027	4/12/2027	25	27																					
217	TCUP-217	SWB # 1.0 - Safety Appraisal	30 days	4/13/2027	5/24/2027	27	28																					
218	TCUP-218	SWB # 1.0 - Delivery Onsite for Testing	20 days	5/25/2027	6/21/2027	28	29																					
219	TCUP-219	SWB # 1.0 - Deployment Onsite Need Date	0 days	6/21/2027	6/21/2027	29	29																					
220	TCUP-220	Data Communication System	405 days	1/15/2025	8/4/2026	0	19																					
221	TCUP-221	Preliminary Design and placement	20 days	1/15/2025	2/11/2025	0	1																					

Task: █ Milestone: ◆ Summary: Critical: █ Progress: █

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025		2026		2027		2028		2029		2030		2031		2032		2033		2034		
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2		
222	TCUP-222	P&S Preliminary Network Design	20 days	2/12/2025	3/11/2025	1	2																					
223	TCUP-223	R&A Preliminary Network Design	20 days	3/12/2025	4/8/2025	2	3																					
224	TCUP-224	Site Visual Inspection	40 days	2/12/2025	4/8/2025	1	3																					
225	TCUP-225	RF simulation	60 days	4/9/2025	7/1/2025	3	5																					
226	TCUP-226	Purchase of parts for RF simulation calibration test	260 days	2/12/2025	2/10/2026	1	13																					
227	TCUP-227	RF Simulation calibration (site test)	15 days	2/11/2026	3/3/2026	13	14																					
228	TCUP-228	P&S Network Design	1 mon	3/4/2026	3/31/2026	14	14																					
229	TCUP-229	R&A Network Design	30 days	4/1/2026	5/12/2026	14	16																					
230	TCUP-230	P&S Network Configuration	3 mons	4/1/2026	6/23/2026	14	17																					
231	TCUP-231	R&A Network Configuration	30 days	6/24/2026	8/4/2026	17	19																					
232	TCUP-232	Installation Design	618 days	1/15/2026	5/29/2028	12	40																					
233	TCUP-233	Generic Installation design	30 days	1/15/2026	2/25/2026	12	13																					
234	TCUP-234	P&S - Pilot - Bookwiring Package	60 days	2/26/2026	5/20/2026	13	16																					
235	TCUP-235	R&A - Pilot - Bookwiring Package	60 days	5/21/2026	8/12/2026	16	19																					
236	TCUP-236	Pilot As built - Bookwiring Package	20 days	5/2/2028	5/29/2028	40	40																					
237	TCUP-237	Training & Manual	354 days	1/15/2025	5/25/2026	0	16																					
238	TCUP-238	Develop training approach	90 days	1/15/2025	5/20/2025	0	4																					
239	TCUP-239	First version of Wayside Manuals - Operation	60 days	3/3/2026	5/25/2026	14	16																					
240	TCUP-240	First version of Wayside Manuals - Maintenance	60 days	7/21/2025	10/10/2025	6	9																					
241	TCUP-241	On board Operation manual	60 days	3/3/2026	5/25/2026	14	16																					
242	TCUP-242	On board Maintenance manual	60 days	6/4/2025	8/26/2025	5	7																					
243	TCUP-243	2-Central Equipment, Delivery, Tools, Documentation and Training	580 days	9/4/2025	11/24/2027	8	34																					
244	TCUP-244	Procurement	580 days	9/4/2025	11/24/2027	8	34																					
245	TCUP-245	PO Placement	250 days	9/4/2025	8/19/2026	8	19																					
246	TCUP-246	PO Placed - Wayside / Long Lead time	5 days	1/15/2026	1/21/2026	12	12																					
247	TCUP-247	PO Placed - Cables	5 days	1/15/2026	1/21/2026	12	12																					
248	TCUP-248	PO Placed - COTS Items	20 days	1/15/2026	2/11/2026	12	13																					
249	TCUP-249	PO Placed - Qualification Unit	5 days	9/4/2025	9/10/2025	8	8																					
250	TCUP-250	PO Placed - Simulator	30 days	5/28/2026	7/8/2026	16	18																					
251	TCUP-251	PO Placed - Special Tools	5 days	5/28/2026	6/3/2026	16	17																					
252	TCUP-252	PO Placed - Central equipment	5 days	8/13/2026	8/19/2026	19	19																					
253	TCUP-253	Manufacturing, FAT, Delivery	555 days	9/11/2025	10/27/2027	8	33																					
254	TCUP-254	Mfg & Delivery CIP COD Port - Cables	336 days	1/22/2026	5/6/2027	12	28																					
255	TCUP-255	Mfg & Delivery CIP COD Port - COTS Items	200 days	2/12/2026	11/18/2026	13	22																					
256	TCUP-256	Mfg Qualification unit	365 days	9/11/2025	2/3/2027	8	25																					
257	TCUP-257	Mfg Long Lead Times	345 days	1/22/2026	5/19/2027	12	28																					
258	TCUP-258	Mfg & Delivery CIP COD Port - Central Equipment	10 mons	9/3/2026	6/9/2027	20	29																					
259	TCUP-259	Wayside equipment first article inspection	20 days	6/10/2027	7/7/2027	29	30																					
260	TCUP-260	Mfg & Delivery CIP COD Port - Simulator	336 days	7/9/2026	10/21/2027	18	33																					
261	TCUP-261	Mfg & Delivery CIP COD Port - Special Tools	365 days	6/4/2026	10/21/2027	17	33																					
262	TCUP-262	Custom Clearance & Delivery on Site	265 days	11/19/2026	11/24/2027	22	34																					
263	TCUP-263	Custom Clearance & Delivery On-site - Cables	20 days	5/7/2027	6/3/2027	28	29																					
264	TCUP-264	Custom Clearance & Delivery On-site - COTS Items	20 days	11/19/2026	12/16/2026	22	23																					
265	TCUP-265	Custom Clearance & Delivery On-site - Central Equipment	20 days	6/24/2027	7/21/2027	29	30																					
266	TCUP-266	Custom Clearance & Delivery On-site - Simulator	20 days	10/22/2027	11/18/2027	33	34																					
267	TCUP-267	Custom Clearance & Delivery On-site - Special Tools	20 days	10/28/2027	11/24/2027	33	34																					
268	TCUP-268	Pilot training	10 days	7/21/2026	8/3/2026	18	19																					
269	TCUP-269	Pilot Training course	5 days	7/21/2026	7/27/2026	18	18																					
270	TCUP-270	Pilot Training	5 days	7/28/2026	8/3/2026	18	19																					
271	TCUP-271	Subway Replacement Training & Manual	311 days	10/13/2025	12/21/2026	9	23																					
272	TCUP-272	Manuals	241 days	10/13/2025	9/14/2026	9	20																					

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025		2026		2027		2028		2029		2030		2031		2032		2033		2034	
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2			
273	TCUP-273	Operation Manuals - Approval	40 days	5/26/2026	7/20/2026	16	18																				
274	TCUP-274	Maintenance Manuals - Approval	40 days	10/13/2025	12/7/2025	9	11																				
275	TCUP-275	Advanced Training manuals	80 days	5/26/2026	9/14/2026	16	20																				
276	TCUP-276	Course guides	261 days	12/8/2025	12/7/2026	11	23																				
277	TCUP-277	Maintenance Training Course Guides and approval	60 days	12/8/2025	2/27/2026	11	13																				
278	TCUP-278	Operation Training Course Guides and approval	60 days	7/28/2026	10/19/2026	18	21																				
279	TCUP-279	Advanced Training Course Guides and approval	60 days	9/15/2026	12/7/2026	20	23																				
280	TCUP-280	Training	211 days	3/2/2026	12/21/2026	14	23																				
281	TCUP-281	Subway Replacement - Maintenance Training Delivery	20 days	3/2/2026	3/27/2026	14	14																				
282	TCUP-282	Subway Replacement- Operation Training Delivery	20 days	10/20/2026	11/16/2026	21	22																				
283	TCUP-283	Subway Replacement- Advanced training	10 days	12/8/2026	12/21/2026	23	23																				
284	TCUP-284	3-On board equipment fitting	1287 days	2/12/2025	1/17/2030	1	60																				
285	TCUP-285	Procurement	1160 days	2/12/2025	7/24/2029	1	54																				
286	TCUP-286	PO placement	20 days	4/9/2025	5/6/2025	3	4																				
287	TCUP-287	PO Placed - 219 LRVs	20 days	4/9/2025	5/6/2025	3	4																				
288	TCUP-288	On board prototype manufacturing	15 mons	2/12/2025	4/7/2026	1	15																				
289	TCUP-289	Manufacturing and delivery	1100 days	5/7/2025	7/24/2029	4	54																				
290	TCUP-290	Mfg. 4 trainsets	21 mons	5/7/2025	12/15/2026	4	23																				
291	TCUP-291	On board equipment First Article Inspection	5 days	12/16/2026	12/22/2026	23	23																				
292	TCUP-292	Delivery CIP SF Port 4 trainsets	20 days	12/23/2026	1/19/2027	23	24																				
293	TCUP-293	Custom Clearance & Delivery On-site - 4 trainsets	7 days	1/20/2027	1/28/2027	24	24																				
294	TCUP-294	Manufacturing- train # 3 to train 50	27 mons	5/7/2025	6/1/2027	4	29																				
295	TCUP-295	Delivery On-site - train # 3 to train 50	4 mons	6/9/2027	9/28/2027	29	32																				
296	TCUP-296	Manufacturing - train # 51 to train 100	31.2 mons	9/24/2025	2/14/2028	8	37																				
297	TCUP-297	Delivery On-site - train # 51 to train 100	4 mons	2/15/2028	6/5/2028	37	41																				
298	TCUP-298	Manufacturing - train # 101 to train 150	36 mons	1/14/2026	10/17/2028	12	45																				
299	TCUP-299	Delivery On-site - train # 101 to train 150	4 mons	10/18/2028	2/6/2029	45	49																				
300	TCUP-300	Manufacturing - train # 151 to train 219	39.5 mons	2/11/2026	2/20/2029	13	49																				
301	TCUP-301	Delivery On site - train # 151 to train 219	5.5 mons	2/21/2029	7/24/2029	49	54																				
302	TCUP-302	First 2 Trains for the Pilot	95 days	1/29/2027	6/10/2027	24	29																				
303	TCUP-303	First Train Installation & SPICO	40 days	1/29/2027	3/25/2027	24	26																				
304	TCUP-304	First train Qualification (DPICO)	10 days	3/26/2027	4/8/2027	26	27																				
305	TCUP-305	Second Train Installation & SPICO	30 days	3/26/2027	5/6/2027	26	28																				
306	TCUP-306	Second Train Qualification (DPICO)	5 days	6/4/2027	6/10/2027	29	29																				
307	TCUP-307	Remaining Trains Installation and Post Installation check out test	697 days	5/7/2027	1/7/2030	28	60																				
308	TCUP-308	Train installation design adjustment	60 days	5/7/2027	7/29/2027	28	30																				
309	TCUP-309	Train # 03 Installation and SPICO	4 wks	7/30/2027	8/26/2027	30	31																				
310	TCUP-310	Train # 04 Installation and SPICO	12 days	8/27/2027	9/13/2027	31	32																				
311	TCUP-311	Train # 05 Installation and SPICO	12 days	9/14/2027	9/29/2027	32	32																				
312	TCUP-312	Train # 06 Installation and SPICO	12 days	9/30/2027	10/15/2027	32	33																				
313	TCUP-313	Train # 07 Installation and SPICO	12 days	10/18/2027	11/2/2027	33	34																				
314	TCUP-314	Train # 08 Installation and SPICO	12 days	11/3/2027	11/18/2027	34	34																				
315	TCUP-315	Train # 09 Installation and SPICO	12 days	11/19/2027	12/6/2027	34	35																				
316	TCUP-316	Train # 10 Installation and SPICO	10 days	12/7/2027	12/20/2027	35	35																				
317	TCUP-317	Train # 11 Installation and SPICO	10 days	12/7/2027	12/20/2027	35	35																				
318	TCUP-318	Train # 12 Installation and SPICO	10 days	12/21/2027	1/3/2028	35	36																				
319	TCUP-319	Train # 13 Installation and SPICO	10 days	12/21/2027	1/3/2028	35	36																				
320	TCUP-320	Train # 14 Installation and SPICO	10 days	1/4/2028	1/17/2028	36	36																				
321	TCUP-321	Train # 15 Installation and SPICO	10 days	1/4/2028	1/17/2028	36	36																				
322	TCUP-322	Train # 16 Installation and SPICO	10 days	1/18/2028	1/31/2028	36	37																				
323	TCUP-323	Train # 17 Installation and SPICO	10 days	1/18/2028	1/31/2028	36	37																				

ID	Activity ID	Task Name	Duration	Start	Finish	NTP - Start	NTP + Finish	H2	2025 H1	2025 H2	2026 H1	2026 H2	2027 H1	2027 H2	2028 H1	2028 H2	2029 H1	2029 H2	2030 H1	2030 H2	2031 H1	2031 H2	2032 H1	2032 H2	2033 H1	2033 H2	2034 H1	2034 H2	
324	TCUP-324	Train # 18 Installation and SPICO	10 days	2/1/2028	2/14/2028	37	37																						
325	TCUP-325	Train # 19 Installation and SPICO	10 days	2/1/2028	2/14/2028	37	37																						
326	TCUP-326	Train # 20 Installation and SPICO	10 days	2/15/2028	2/28/2028	37	37																						
327	TCUP-327	Train # 21 to #51 Installation and SPICO (8d each, 2 trains in parallel)	120 days	2/29/2028	8/14/2028	37	43																						
328	TCUP-328	Train # 52 to #100 Installation and SPICO (8d each, 4 trains in parallel)	112 days	8/15/2028	1/17/2029	43	48																						
329	TCUP-329	Train # 101 to #219 Installation and SPICO (8d each, 4 trains in parallel)	253 days	1/18/2029	1/7/2030	48	60																						
330	TCUP-330	Train dynamic testing on the Pilot track	625 days	8/27/2027	1/17/2030	31	60																						
331	TCUP-331	Train # 03 Dynamic testing	4 days	8/27/2027	9/1/2027	31	32																						
332	TCUP-332	Train # 04 Dynamic testing	4 days	9/14/2027	9/17/2027	32	32																						
333	TCUP-333	Train # 05 Dynamic testing	4 days	9/30/2027	10/5/2027	32	33																						
334	TCUP-334	Train # 06 Dynamic testing	3 days	10/18/2027	10/20/2027	33	33																						
335	TCUP-335	Train # 07 Dynamic testing	3 days	11/3/2027	11/5/2027	34	34																						
336	TCUP-336	Train # 08 Dynamic testing	3 days	11/19/2027	11/23/2027	34	34																						
337	TCUP-337	Train # 09 Dynamic testing	3 days	12/7/2027	12/9/2027	35	35																						
338	TCUP-338	Train # 10 Dynamic testing	2 days	12/21/2027	12/22/2027	35	35																						
339	TCUP-339	Train # 11 Dynamic testing	2 days	12/23/2027	12/24/2027	35	35																						
340	TCUP-340	Train # 12 Dynamic testing	2 days	1/4/2028	1/5/2028	36	36																						
341	TCUP-341	Train # 13 Dynamic testing	2 days	1/6/2028	1/7/2028	36	36																						
342	TCUP-342	Train # 14 Dynamic testing	2 days	1/18/2028	1/19/2028	36	36																						
343	TCUP-343	Train # 15 Dynamic testing	2 days	1/20/2028	1/21/2028	36	36																						
344	TCUP-344	Train # 16 Dynamic testing	2 days	2/1/2028	2/2/2028	37	37																						
345	TCUP-345	Train # 17 Dynamic testing	2 days	2/3/2028	2/4/2028	37	37																						
346	TCUP-346	Train # 18 Dynamic testing	2 days	2/15/2028	2/16/2028	37	37																						
347	TCUP-347	Train # 19 Dynamic testing	2 days	2/17/2028	2/18/2028	37	37																						
348	TCUP-348	Train # 20 Dynamic testing	2 days	2/29/2028	3/1/2028	37	38																						
349	TCUP-349	Train # 21 to #100 DPICO (2d each)	233 days	3/10/2028	1/30/2029	38	49																						
350	TCUP-350	Train # 101 to #219 DPICO (2d each)	253 days	1/30/2029	1/17/2030	49	60																						
351	TCUP-351	Training and Manual	236 days	8/27/2025	7/22/2026	7	18																						
352	TCUP-352	On board Operation course guide	40 days	5/26/2026	7/20/2026	16	18																						
353	TCUP-353	On board Maintenance course guide	80 days	8/27/2025	12/16/2025	7	11																						
354	TCUP-354	On board Operation Training	2 days	7/21/2026	7/22/2026	18	18																						
355	TCUP-355	On board Maintenance Training	5 days	12/17/2025	12/23/2025	11	11																						
356	TCUP-356	4-Pilot Deployment Phase	1456 days	1/15/2026	8/14/2031	12	79																						
357	TCUP-357	P&S Construction Final Design	40 days	8/17/2026	10/9/2026	19	21																						
358	TCUP-358	R&A Construction Final Design	20 days	10/12/2026	11/6/2026	21	22																						
359	TCUP-359	Procurement and Delivery	380 days	1/15/2026	6/30/2027	12	29																						
360	TCUP-360	Long lead time items	18 mons	1/15/2026	6/2/2027	12	29																						
361	TCUP-361	Pilot equipment delivery	17 mons	3/12/2026	6/30/2027	14	29																						
362	TCUP-362	Pre Installation Period	5 mons	10/12/2026	2/26/2027	21	25																						
363	TCUP-363	Installation by SFMTA	3 mons	7/1/2027	9/22/2027	29	32																						
364	TCUP-364	Sw Development and Factory Testing SWB # 2.0	170 days	4/13/2027	12/6/2027	27	35																						
365	TCUP-365	SWB # 2.0 - Sw development	90 days	4/13/2027	8/16/2027	27	31																						
366	TCUP-366	SWB # 2.0 - Informal FAT (Dry Run FAT)	20 days	8/17/2027	9/13/2027	31	32																						
367	TCUP-367	SWB # 2.0 - Factory Acceptance Test (FAT)	20 days	9/14/2027	10/11/2027	32	33																						
368	TCUP-368	SWB # 2.0 - Safety Appraisal	10 days	10/12/2027	10/25/2027	33	33																						
369	TCUP-369	SWB # 2.0 - Delivery Onsite for Testing	30 days	10/26/2027	12/6/2027	33	35																						
370	TCUP-370	Sw Development and Factory Testing SWB # 3.0	55 days	5/9/2028	7/24/2028	40	42																						
371	TCUP-371	SWB # 3.0 - Sw development	20 days	5/9/2028	6/5/2028	40	41																						
372	TCUP-372	SWB # 3.0 - Informal FAT (Dry Run FAT)	10 days	6/6/2028	6/19/2028	41	41																						
373	TCUP-373	SWB # 3.0 - Factory Acceptance Test (FAT)	10 days	6/20/2028	7/3/2028	41	42																						
374	TCUP-374	SWB # 3.0 - Safety Appraisal	10 days	7/4/2028	7/17/2028	42	42																						






ID	Activity ID	Task Name	Duration	Start	Finish	NTP - Start	NTP + Finish	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
375	TCUP-375	SWB # 3.0 - Delivery Onsite for Testing	5 days	7/18/2028	7/24/2028	42	42											
376	TCUP-376	Pilot Site Testing and Commissioning	158 days	9/23/2027	5/1/2028	32	40											
377	TCUP-377	Pilot preliminary testing	60 days	9/23/2027	12/15/2027	32	35											
378	TCUP-378	System Integration Test (Static tests)	60 days	12/7/2027	2/28/2028	35	37											
379	TCUP-379	Pilot - CBTC - Dynamic tests- step 1	15 days	2/29/2028	3/20/2028	37	38											
380	TCUP-380	Pilot - CBTC - Dynamic tests-step 2	15 days	3/21/2028	4/10/2028	38	39											
381	TCUP-381	Pilot - CBTC - Dynamic tests-step3	15 days	4/11/2028	5/1/2028	39	40											
382	TCUP-382	Site Acceptance Test (21 Jun 28)	17 days	5/2/2028	5/24/2028	40	40											
383	TCUP-383	Site Acceptance Test Report acceptance	20 days	5/25/2028	6/21/2028	40	41											
384	TCUP-384	Operation Training	20 days	3/30/2028	4/26/2028	38	39											
385	TCUP-385	Maintenance Training	20 days	9/23/2027	10/20/2027	32	33											
386	TCUP-386	P&S Safety Case	20 days	5/25/2028	6/21/2028	40	41											
387	TCUP-387	R&A M1 Safety Case - Client / ISA Approval	20 days	6/22/2028	7/19/2028	41	42											
388	TCUP-388	Pilot ready for revenue (MM 19 Jul 28)	0 days	7/19/2028	7/19/2028	42	42											
389	TCUP-389	Pilot Operating Period (ends at subway crossover)	20 mons	8/10/2028	2/20/2030	43	61											
390	TCUP-390	Pilot Conditional Acceptance	386 days	2/21/2030	8/14/2031	61	79											
391	TCUP-391	Pilot Warranty Period (MM 19 Aug 31)	386 days	2/21/2030	8/14/2031	61	79											
392	TCUP-392	5-Subway Replacement Deployment Phase	1207 days	1/4/2027	8/19/2031	24	79											
393	TCUP-393	P&S Construction Final Design	80 days	1/4/2027	4/23/2027	24	27											
394	TCUP-394	R&A Construction Final Design	30 days	4/26/2027	6/4/2027	27	29											
395	TCUP-395	Procurement and Delivery	18 mons	3/1/2027	7/14/2028	25	42											
396	TCUP-396	Pre Installation Period	3 mons	12/20/2027	3/10/2028	35	38											
397	TCUP-397	Installation by SFMTA	3 mons	7/7/2028	10/6/2028	42	45											
398	TCUP-398	Software Development and Factory Testing	543 days	10/12/2027	11/8/2029	33	58											
399	TCUP-399	System Design review post Pilot testing phase	1 day	5/2/2028	5/2/2028	40	40											
400	TCUP-400	SWB # 4.0 - candidate for T&C	348 days	10/12/2027	2/8/2029	33	49											
401	TCUP-401	SWB # 4.0 - SW Development	164 days	10/12/2027	5/26/2028	33	40											
402	TCUP-402	SWB # 4.0 - Informal FAT (Dry Run FAT)	54 days	5/29/2028	8/10/2028	40	43											
403	TCUP-403	SWB # 4.0 - SW corrections from Pilot tests	50 days	8/11/2028	10/19/2028	43	45											
404	TCUP-404	SWB # 4.0 - Informal FAT (Dry Run FAT)	20 days	10/20/2028	11/16/2028	45	46											
405	TCUP-405	SWB # 4.0 - Factory Acceptance Test (FAT)	40 days	11/17/2028	1/11/2029	46	48											
406	TCUP-406	SWB # 4.0 - Safety Appraisal and delivery to site	20 days	1/12/2029	2/8/2029	48	49											
407	TCUP-407	SWB # 5.0 - Revenue Build	50 days	8/31/2029	11/8/2029	56	58											
408	TCUP-408	SWB # 5.0 - SW Development	20 days	8/31/2029	9/27/2029	56	56											
409	TCUP-409	SWB # 5.0 - Informal FAT (Dry Run FAT)	10 days	9/28/2029	10/11/2029	56	57											
410	TCUP-410	SWB # 5.0 - Factory Acceptance Test (FAT)	10 days	10/12/2029	10/25/2029	57	57											
411	TCUP-411	SWB # 5.0 - Safety Appraisal and delivery to site	10 days	10/26/2029	11/8/2029	57	58											
412	TCUP-412	Subway Replacement Site Testing and Commissioning	140 days	2/9/2029	8/23/2029	49	55											
413	TCUP-413	System Integration Test (Static tests)	40 days	2/9/2029	4/5/2029	49	51											
414	TCUP-414	Subway Replacement - CBTC - Dynamic tests, step 1	40 days	4/6/2029	5/31/2029	51	53											
415	TCUP-415	Subway Replacement - CBTC - Dynamic tests, step 2	30 days	6/1/2029	7/12/2029	53	54											
416	TCUP-416	Subway Replacement - CBTC - Dynamic tests, step 3	30 days	7/13/2029	8/23/2029	54	55											
417	TCUP-417	Site Acceptance Test	20 days	8/24/2029	9/20/2029	55	56											
418	TCUP-418	SAT correction, Report acceptance (MM 23 Jan 30)	40 days	9/7/2029	11/1/2029	56	58											
419	TCUP-419	Subway Replacement Follow up Training	10 days	8/24/2029	9/6/2029	55	56											
420	TCUP-420	P&S Safety Case Update	20 days	12/27/2029	1/23/2030	59	60											
421	TCUP-421	R&A Safety Case Update - Client / ISA Approval	20 days	1/24/2030	2/20/2030	60	61											
422	TCUP-422	Subway crossover (MM 20 Feb 30)	0 days	2/20/2030	2/20/2030	61	61											
423	TCUP-423	Subway Replacement Conditional acceptance (19 Aug 31)	389 days	2/21/2030	8/19/2031	61	79											
424	TCUP-424	Subway Warranty Period	389 days	2/21/2030	8/19/2031	61	79											
425	TCUP-425	First RAM Demonstration	6 mons	2/21/2030	8/7/2030	61	67											

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
426	TCUP-426	Removal of all legacy ATCS equipment from vehicles	0 days	2/20/2030	2/20/2030	61	61											
427	TCUP-427	6 - N Expansion Deployment Phase	1097 days	11/22/2027	2/3/2032	34	85											
428	TCUP-428	P&S Construction Final Design	60 days	11/22/2027	2/11/2028	34	37											
429	TCUP-429	R&A Construction Final Design	30 days	2/14/2028	3/24/2028	37	38											
430	TCUP-430	Procurement and Delivery	18 mons	11/22/2027	4/6/2029	34	51											
431	TCUP-431	Software Development and Factory Testing	80 days	9/21/2029	1/10/2030	56	60											
432	TCUP-432	SWB # 6.0 - SW Development	30 days	9/21/2029	11/1/2029	56	58											
433	TCUP-433	SWB # 6.0 - Informal FAT (Dry Run FAT)	20 days	11/2/2029	11/29/2029	58	58											
434	TCUP-434	SWB # 6.0 - Factory Acceptance Test (FAT)	20 days	11/30/2029	12/27/2029	59	59											
435	TCUP-435	SWB # 6.0 - Safety Appraisal and delivery to site	10 days	12/28/2029	1/10/2030	59	60											
436	TCUP-436	Pre Installation Period	3 mons	10/9/2028	12/29/2028	45	47											
437	TCUP-437	Installation by SFMTA	2 mons	4/9/2029	6/1/2029	51	53											
438	TCUP-438	N Expansion Site Testing and Commissioning	89 days	1/11/2030	5/15/2030	60	64											
439	TCUP-439	System integration Test (Static tests)	40 days	1/11/2030	3/7/2030	60	62											
440	TCUP-440	N Expansion - CBTC - Dynamic tests, step 1	20 days	3/8/2030	4/4/2030	62	63											
441	TCUP-441	N Expansion - CBTC - Dynamic tests, step 2	15 days	4/5/2030	4/25/2030	63	63											
442	TCUP-442	N Expansion - CBTC - Dynamic tests, step 3	14 days	4/26/2030	5/15/2030	63	64											
443	TCUP-443	Site Acceptance Test	20 days	5/16/2030	6/12/2030	64	65											
444	TCUP-444	Site Acceptance Test report acceptance	20 days	6/13/2030	7/10/2030	65	66											
445	TCUP-445	P&S Safety Case Update	20 days	6/13/2030	7/10/2030	65	66											
446	TCUP-446	R&A Safety Case Update - Client / ISA Approval	20 days	7/11/2030	8/7/2030	66	67											
447	TCUP-447	N Expansion Revenue (7 Aug 30)	0 days	8/7/2030	8/7/2030	67	67											
448	TCUP-448	N Expansion Conditional Acceptance	389 days	8/8/2030	2/3/2032	67	85											
449	TCUP-449	N Expansion Warranty Period (3 Feb 32)	389 days	8/8/2030	2/3/2032	67	85											
450	TCUP-450	7-T Expansion Deployment Phase	1047 days	7/17/2028	7/20/2032	42	90											
451	TCUP-451	P&S Construction Final Design	60 days	7/17/2028	10/6/2028	42	45											
452	TCUP-452	R&A Construction Final Design	30 days	10/9/2028	11/17/2028	45	46											
453	TCUP-453	Procurement and Delivery	18 mons	10/9/2028	2/22/2030	45	61											
454	TCUP-454	Software Development and Factory Testing	80 days	9/21/2029	1/10/2030	56	60											
455	TCUP-455	SWB # 6.0 - SW Development	30 days	9/21/2029	11/1/2029	56	58											
456	TCUP-456	SWB # 6.0 - Informal FAT (Dry Run FAT)	20 days	11/2/2029	11/29/2029	58	58											
457	TCUP-457	SWB # 6.0 Factory Acceptance Test (FAT)	20 days	11/30/2029	12/27/2029	59	59											
458	TCUP-458	SWB # 6.0 - Safety Appraisal and delivery to site	10 days	12/28/2029	1/10/2030	59	60											
459	TCUP-459	Pre Installation Period	3 mons	6/4/2029	8/24/2029	53	55											
460	TCUP-460	Installation by SFMTA	2 mons	2/25/2030	4/19/2030	61	63											
461	TCUP-461	T Expansion Site Testing and Commissioning	100 days	6/13/2030	10/30/2030	65	70											
462	TCUP-462	System integration Test (Static tests)	40 days	6/13/2030	8/7/2030	65	67											
463	TCUP-463	T Expansion - CBTC - Dynamic tests, step 1	20 days	8/8/2030	9/4/2030	67	68											
464	TCUP-464	T Expansion - CBTC - Dynamic tests, step 2	20 days	9/5/2030	10/2/2030	68	69											
465	TCUP-465	T Expansion - CBTC - Dynamic tests, step 3	20 days	10/3/2030	10/30/2030	69	70											
466	TCUP-466	Site Acceptance Test	20 days	10/31/2030	11/27/2030	70	70											
467	TCUP-467	Site Acceptance Test Report acceptance	20 days	11/28/2030	12/25/2030	70	71											
468	TCUP-468	P&S Safety Case Update	20 days	11/28/2030	12/25/2030	70	71											
469	TCUP-469	R&A Safety Case Update - Client / ISA Approval	20 days	12/26/2030	1/22/2031	71	72											
470	TCUP-470	T Expansion Revenue (22 Jan 31)	0 days	1/22/2031	1/22/2031	72	72											
471	TCUP-471	T Expansion Conditional Acceptance	389 days	1/23/2031	7/20/2032	72	90											
472	TCUP-472	T Expansion Warranty Period (20 Jul 32)	389 days	1/23/2031	7/20/2032	72	90											
473	TCUP-473	8-K&M Expansions Deployment Phase	997 days	3/12/2029	1/4/2033	50	96											
474	TCUP-474	P&S Construction Final Design	80 days	3/12/2029	6/29/2029	50	53											
475	TCUP-475	R&A Construction Final Design	30 days	7/2/2029	8/10/2029	54	55											

Task Summary Critical Progress Milestone

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
476	TCUP-476	Procurement and Delivery	18 mons	3/12/2029	7/26/2030	50	66											
477	TCUP-477	Software Development and Factory Testing	100 days	6/13/2030	10/30/2030	65	70											
478	TCUP-478	SWB # 7.0 - SW Development	40 days	6/13/2030	8/7/2030	65	67											
479	TCUP-479	SWB # 7.0 - Informal FAT (Dry Run FAT)	30 days	8/8/2030	9/18/2030	67	68											
480	TCUP-480	SWB # 7.0 - Factory Acceptance Test (FAT)	20 days	9/19/2030	10/16/2030	68	69											
481	TCUP-481	SWB # 7.0 - Safety Appraisal and delivery to site	10 days	10/17/2030	10/30/2030	69	70											
482	TCUP-482	Pre Installation Period	3 mons	2/25/2030	5/17/2030	61	64											
483	TCUP-483	Installation by SFMTA	2 mons	7/29/2030	9/20/2030	66	68											
484	TCUP-484	K&M Expansions Site Testing and Commissioning	95 days	11/28/2030	4/9/2031	70	75											
485	TCUP-485	System Integration Test (Static tests)	40 days	11/28/2030	1/22/2031	70	72											
486	TCUP-486	K&M Expansion - CBTC - Dynamic tests, step 1	20 days	1/23/2031	2/19/2031	72	73											
487	TCUP-487	K&M Expansion - CBTC - Dynamic tests, step 2	20 days	2/20/2031	3/19/2031	73	74											
488	TCUP-488	K&M Expansion - CBTC - Dynamic tests, step 3	15 days	3/20/2031	4/9/2031	74	75											
489	TCUP-489	Site Acceptance Test and report acceptance	40 days	4/10/2031	6/4/2031	75	77											
490	TCUP-490	P&S Safety Case Update	20 days	5/8/2031	6/4/2031	76	77											
491	TCUP-491	R&A Safety Case Update - Client / ISA Approval	20 days	6/5/2031	7/2/2031	77	78											
492	TCUP-492	K&M Expansion Revenue (9 Jul 31)	0 days	7/2/2031	7/2/2031	78	78											
493	TCUP-493	K&M Expansions Conditional Acceptance	394 days	7/3/2031	1/4/2033	78	96											
494	TCUP-494	K&M Expansion Warranty Period (4 Jan 33)	394 days	7/3/2031	1/4/2033	78	96											
495	TCUP-495	9-I Expansion Deployment Phase	947 days	11/5/2029	6/21/2033	58	101											
496	TCUP-496	P&S Construction Final Design	40 days	11/5/2029	12/28/2029	58	59											
497	TCUP-497	R&A Construction Final Design	30 days	12/31/2029	2/8/2030	60	61											
498	TCUP-498	Procurement and Delivery	17 mons	11/5/2029	2/21/2031	58	73											
499	TCUP-499	Software Development and Factory Testing	100 days	11/28/2030	4/16/2031	70	75											
500	TCUP-500	SWB # 8.0 - SW Development	40 days	11/28/2030	1/22/2031	70	72											
501	TCUP-501	SWB # 8.0 - Informal FAT (Dry Run FAT)	30 days	1/23/2031	3/5/2031	72	74											
502	TCUP-502	SWB # 8.0 - Factory Acceptance Test (FAT)	20 days	3/6/2031	4/2/2031	74	75											
503	TCUP-503	SWB # 8.0 - Safety Appraisal and delivery to site	10 days	4/3/2031	4/16/2031	75	75											
504	TCUP-504	Pre Installation Period	3 mons	8/26/2030	11/15/2030	67	70											
505	TCUP-505	Installation by SFMTA	2 mons	3/10/2031	5/2/2031	74	76											
506	TCUP-506	J Expansion Site Testing and Commissioning	100 days	5/8/2031	9/24/2031	76	80											
507	TCUP-507	System Integration Test (Static tests)	40 days	5/8/2031	7/2/2031	76	78											
508	TCUP-508	J Expansion - CBTC - Dynamic tests, step 1	20 days	7/3/2031	7/30/2031	78	78											
509	TCUP-509	J Expansion - CBTC - Dynamic tests, step 2	20 days	7/31/2031	8/27/2031	79	79											
510	TCUP-510	J Expansion - CBTC - Dynamic tests, step 3	20 days	8/28/2031	9/24/2031	79	80											
511	TCUP-511	Site Acceptance Test and report acceptance	40 days	9/25/2031	11/19/2031	80	82											
512	TCUP-512	P&S Safety Case Update	20 days	10/23/2031	11/19/2031	81	82											
513	TCUP-513	R&A Safety Case Update - Client / ISA Approval	20 days	11/20/2031	12/17/2031	82	83											
514	TCUP-514	J Expansion Revenue (24 Dec 31)	0 days	12/17/2031	12/17/2031	83	83											
515	TCUP-515	J Expansion Conditional Acceptance	394 days	12/18/2031	6/21/2033	83	101											
516	TCUP-516	J Expansion Warranty period (21 Jun 33)	394 days	12/18/2031	6/21/2033	83	101											
517	TCUP-517	10-L Expansion Deployment Phase	942 days	6/17/2030	1/24/2034	65	108											
518	TCUP-518	P&S Construction Final Design	20 days	6/17/2030	7/12/2030	65	66											
519	TCUP-519	R&A Construction Final Design	20 days	7/15/2030	8/9/2030	66	67											
520	TCUP-520	Procurement and Delivery	17 mons	6/17/2030	10/3/2031	65	81											
521	TCUP-521	Software Development and Factory Testing	100 days	7/31/2031	12/17/2031	79	83											
522	TCUP-522	SWB # 9.0 - SW Development	40 days	7/31/2031	9/24/2031	79	80											
523	TCUP-523	SWB # 9.0 - Informal FAT (Dry Run FAT)	30 days	9/25/2031	11/5/2031	80	82											
524	TCUP-524	SWB # 9.0 - Factory Acceptance Test (FAT)	20 days	11/6/2031	12/3/2031	82	83											
525	TCUP-525	SWB # 9.0 - Safety Appraisal and delivery to site	10 days	12/4/2031	12/17/2031	83	83											

ID	Activity ID	Task Name	Duration	Start	Finish	NTP + Start	NTP + Finish	2025		2026		2027		2028		2029		2030		2031		2032		2033		2034	
								H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	
526	TCUP-526	Pre Installation Period	3 mons	2/24/2031	5/16/2031	73	76																				
527	TCUP-527	Installation by SFMTA	2 mons	10/6/2031	11/28/2031	81	82																				
528	TCUP-528	L Expansion Site Testing and Commissioning	90 days	12/18/2031	4/21/2032	83	87																				
529	TCUP-529	System Integration Test (Static tests)	40 days	12/18/2031	2/11/2032	83	85																				
530	TCUP-530	L Expansion - CBTC - Dynamic tests, step 1	20 days	2/12/2032	3/10/2032	85	86																				
531	TCUP-531	L Expansion - CBTC - Dynamic tests, step 2	15 days	3/11/2032	3/31/2032	86	87																				
532	TCUP-532	L Expansion - CBTC - Dynamic tests, step 3	15 days	4/1/2032	4/21/2032	87	87																				
533	TCUP-533	Site Acceptance Test and report acceptance	40 days	4/22/2032	6/16/2032	87	89																				
534	TCUP-534	Final Follow up Training	20 days	6/1/2032	7/14/2032	89	90																				
535	TCUP-535	P&S Safety Case Update	20 days	6/3/2032	6/30/2032	89	90																				
536	TCUP-536	R&A Safety Case Update - Client / ISA Approval	20 days	7/1/2032	7/28/2032	90	90																				
537	TCUP-537	L Expansion Revenue (28 Jul 32)	0 days	7/28/2032	7/28/2032	90	90																				
538	TCUP-538	L Expansion Conditional Acceptance	389 days	7/29/2032	1/24/2034	90	108																				
539	TCUP-539	L Expansion Warranty period (24 Jan 34)	389 days	7/29/2032	1/24/2034	90	108																				
540	TCUP-540	Final RAM Demonstration period	6 mons	7/29/2032	1/12/2033	90	96																				

Task		Milestone 	Summary 	Critical 	Progress 
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Appendix E

CONTRACT CHANGES

E1. GENERAL REQUIREMENTS

- E1.1** The procedures and requirements set forth in this Appendix E are intended to ensure that when changes to the Work, in Contract Time or Contract Amount are proposed or rendered necessary in accordance with the Agreement, the Contractor and SFMTA will timely confer as to the need, purpose and requirements of the Change, so that the Contractor will provide the SFMTA with its best estimate of the costs and impacts associated with the proposed changed Work and the SFMTA may evaluate the proposed Change and proceed on an informed basis. These requirements and procedures are also intended to facilitate payment to the Contractor of additional, undisputed compensation for Contractor's performance of changed Work.
- E1.2** The provisions of this Appendix E clarify but are subordinate to Article 4 of the Agreement, Financial Matters and 12.5 Contract Modifications and Change Orders. Contractor shall conform its Project Management Plan to the requirements and procedures set out in this Appendix E.
- E1.3** Contractor and the SFMTA will confer on the status of outstanding Contractor Requests for Information (RFIs), SFMTA Clarifications, Requests for Contract Change (RCCs) from Contractor, and SFMTA Proposed Contract Changes (PCCs), as stated in the Project Management Plan.
- E1.4** Failure by the Contractor to comply with the procedures of this Appendix E may constitute a waiver of any subsequent claim by the Contractor arising out of such Change Order, if the SFMTA determines that Contractor's failure to submit a timely RCC or meet other change process requirement has denied the SFMTA timely information or opportunity to timely consider alternatives or mitigations, or has otherwise prejudiced the SFMTA's interests.
- E1.5** Contractor shall maintain its records in such a manner as to provide a clear distinction between the direct and indirect costs of Work under Changes and Change Orders and the direct and indirect costs of original Contract Work. This requirement pertains to all types of Changes and Change Orders, as well as the additions, deletions, revisions, RCCs, PCCs, and claims initiated by Contractor.

E2. REQUESTS FOR INFORMATION AND CLARIFICATIONS

- E2.1** Should Contractor believe there is a contradiction, error, omission, or other problem in the Contract Documents, or should Contractor have a question as to the meaning or intent of any provision of the Contract Documents, or should the SFMTA's comments on submittals returned to Contractor appear to Contractor to change the requirements or scope of the Work, Contractor shall promptly submit a

Request for Information ("RFI") to the SFMTA requesting clarification, direction, or a Change. Contractor shall coordinate and schedule its Work to provide the SFMTA sufficient time (as provided in Section E2.2 below) to confer with Contractor and issue a written reply to the RFI before Contractor proceeds with the Work at issue.

E2.2 The SFMTA will issue a reply to a RFI within 15 Days of receipt of the RFI. The reply may include a written Clarification or a Proposed Contract Change. If the SFMTA needs additional time to issue a reply, the SFMTA will notify the Contractor of the time it will require, but in no event shall the time SFMTA needs to respond exceed thirty (30) Days.

E2.3 A Clarification is binding on Contractor, and Contractor shall perform the Work as described in the Clarification. A Clarification is not a Change Order and does not entitle Contractor to a modification of the Contract Amount or a change in the Contract Time. If Contractor believes that a Clarification increases the costs of the Work or impacts a Milestone completion date or the Project final completion date, Contractor may submit a Request for Contract Change (RCC).

E3. CONTRACTOR REQUESTS FOR CONTRACT CHANGE (RCCs)

E3.1 Request for Contract Change. If the Contractor seeks additional compensation or extension of time due to the directives of a Clarification, or for any other purpose, Contractor shall submit to the SFMTA Project Manager a Request for Contract Change (RCC) within ten Days of the date of the Clarification or the date of Notice of Delay confirmation after Contractor first becomes aware of the additional cost or extended time caused by a problem in the Contract Documents or by an Unavoidable Delay (See section 5.18.3).

E3.2 RCC Contents. An RCC shall reference relevant Contract Specifications, and shall include a detailed explanation of the basis for Contractor's request and a cost and time proposal as required by Section E5.1 below. Contractor shall provide the SFMTA Project Manager any relevant information that the SFMTA requests so that the SFMTA Project Manager may better understand the scope and reason for the RCC. Contractor shall not submit an RCC on any issue without first submitting an RFI, unless the SFMTA authorizes Contractor to submit an RCC without first submitting an RFI. For clarity, an RCC due to an Unavoidable Delay shall not be subject to the prior submission of an RFI.

E4. SFMTA PROPOSED CONTRACT CHANGES (PCCs)

E4.1 PCC Initiation. The SFMTA may, at any time between the Notice to Proceed and the end of the Support Term, and without notice to Contractor's surety, order additions, deletions, or revisions in the Work within the general scope of the Contract Documents by negotiated bilateral Contract Modification or Unilateral Contract Modification in accordance with Agreement Section 12.5 and this Appendix E. The SFMTA will initiate a Contract Modification by issuing a

Proposed Contract Change (PCC). A PCC will include a detailed description of the proposed additions, deletions or revisions to the Work, which may include supplementary or revised Drawings and Specifications, and will request from Contractor a quotation of cost and time, and a description of the Contractor's approach for completing the proposed changes to the Work.

E4.2 PCC Proposal. Contractor shall submit a PCC Proposal (meeting the requirements stated in Section E5.1 below) to the SFMTA Project Manager within 10 Days of receipt of a PCC. Contractor may request additional time as long as such request is made within 10 Days of the date of the PCC.

E5. PROCESSING OF RCCs AND PCC PROPOSALS

E5.1 Proposal Requirements. RCCs and PCC Proposals shall include cost proposals containing a complete itemized breakdown of all labor, Material, Equipment, profit, overhead and any other costs to perform the changed Work consistent with the cost categories set out in Appendices B and G and accounted as required under federal Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, set out in 2 CFR §§ 200.400-476 (Cost Principles). RCCs and PCC Proposals shall also include a time impact analysis showing the impact of the change Work on Milestone completion dates and the Project completion date.

E5.2 Meet and Confer. The SFMTA Project Manager and will meet and confer with Contractor to discuss RCCs and PCC Proposals within 15 Days of their receipt.

E5.3 Draft Determination. The SFMTA Project Manager will provide Contractor a draft written determination in accordance with Section 12.7 within 30 Days after receipt of an RCC or a PCC Proposal, in order to give Contractor the opportunity to respond with comments and proposed changes.

E5.4 Final Determination.

E5.4.1 If the Contractor provides a written response within fifteen (15) Days after receipt of the draft determination, the SFMTA Project Manager will issue a final written determination that addresses Contractor's response no later than fifteen (15) Days after receipt of Contractor's responses, unless both parties agree in writing to a different due date for the final written determination.

E5.4.2 Subject to any alternative due date agreed upon between the Parties, if the Contractor does not provide a response within ten Days after receipt of the draft determination, the draft determination will become final.

E5.5 Claim.

E5.5.1 If the final determination rejects a RCC or PCC Proposal in whole or in part, Contractor may contest that decision by filing a timely written claim per Section 12.6 of the Agreement (Contract Claim Requirements).

E5.5.2 For a RCC, if the SFMTA Project Manager does not issue a draft written determination within the time described in section E5.3, the RCC may be deemed rejected and Contractor may pursue a claim under Section 12.6 of the Agreement.

E6. BILATERAL CONTRACT MODIFICATIONS

E6.1 Execution of Contract Modifications. When the SFMTA and Contractor agree on the total cost and time in a final determination of an RCC or a PCC Proposal, the SFMTA will include the agreement in a bilateral Contract Modification implementing the change. No oral instructions of any person whomsoever shall in any manner or degree can modify or otherwise affect the terms of the Contract. Contract Modifications that result in an increase to the Contract Amount or Contract Time must be approved in accordance with SFMTA policies and City Charter section 9.118. (See also General Provisions, Sections 4.1 to 4.3).

E6.2 Release of Claims. The parties agree to make good faith efforts to resolve all issues and disputes concerning cost and time impacts when the parties execute a bilateral Contract Modification. Accordingly, bilateral Contract Modifications shall contain the following provision (unless both parties agree to use different release language for a specific Contract Modification):

The compensation and any time extension provided in this Modification comprises the total compensation and time extension due to Contractor, all Affiliates, Subcontractors and all Suppliers, for the changed Work described in this Modification, including any impact on unchanged Work and Ancillary Work necessary to perform the changed Work. By executing this Modification, Contractor acknowledges and agrees on behalf of itself, all Affiliates, Subcontractors, and all Suppliers, that the stated time extension and compensation includes all time extension and all compensation owed for all Work described in the Modification, plus all time extension and compensation owed for the interruption of schedules, extended field and home overhead costs, delay, and all impact, ripple effect or cumulative impact on all other Work. The parties' execution of this Modification indicates that the Modification constitutes full mutual accord and satisfaction of all costs and impacts arising from or related to the changed Work. The Contractor, on behalf of itself, all Affiliates, Subcontractors, and all Suppliers, waives all rights, without exception or reservation of any kind whatsoever in law or equity, to seek or receive further compensation or time extension related to this Work described in this Modification."

E6.3 A Contract Modification shall not in any way release any of Contractor's obligations, guarantees or warranties under the Contract, nor shall they relieve or release Contractor's sureties of bond obligations issued for this Contract. The sureties, in executing such bonds, shall be deemed to have expressly agreed to any such Contract Modifications and to any extension of Contract Time and increase in Contract Amount effected by any Contract Modification. Contractor shall be

responsible for informing its surety of any change affecting the Work, Contract Amount or Contract Time that is required by the provisions of any bond.

E7. UNILATERAL CHANGE ORDERS

- E7.1 General.** If Contractor fails to submit a PCC Proposal within the period referenced in Section E.4.2, or if the SFMTA Project Manager determines that: (1) the Parties cannot agree on a price or time adjustment for the Additional Work described in the PCC Proposal; or (2) the urgency of the Additional Work does not allow time for the parties to negotiate a bilateral Contract Modification, the SFMTA Project Manager may direct Contractor to proceed with the Changes under a unilateral Contract Modification instructing Contractor to proceed with the Changes based on the SFMTA's estimate of the cost and/or time impact of the Changes. A unilateral Contract Modification will be issued under section 12.5 of the Agreement (Contract Modifications and Change Orders) and will be binding on Contractor, and Contractor shall perform the Work as specified in the unilateral Contract Modification.
- E7.2 Limitations on Unilateral Contract Modifications.** Unilateral Contract Modifications will include a not-to-exceed price and requirements for timely reporting of Contractor's costs incurred on Work included in the Contract Modification. The Contractor will not be required to continue the Work after it has incurred costs in the not-to-exceed amount. In no event will the total price of the unilateral Contract Modification be greater than the amount of the contracting authority delegated to the SFMTA official that signs the modification.
- E7.3 Claim.** If Contractor disagrees with any terms or conditions of a unilateral Contract Modification, Contractor may, within 30 Days of receipt of the unilateral Contract Modification, submit a claim under Agreement Section 12.6.

Appendix F
Performance Bonds

Appendix F1
PROCUREMENT TERM PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that WHEREAS, the City and County of San Francisco, State of California, has awarded to:

hereinafter designated as the “Principal”, a contract, dated, _____, for the City and County of San Francisco's Office of Contract Administration Contract No. _____ (the “Contract”).

WHEREAS, said Principal is required under clause 5.19 of the Contract to furnish to the City and County of San Francisco ("City") a bond for the faithful performance of the Contract before Final Acceptance of the Procurement Term portion of the Contract (the “Procurement Term Performance Bond”) in an amount of not less than 100% of the Total System Procurement Price;

WHEREAS, under clause 5.19.1 of the Contract, the Procurement Term Performance Bond shall terminate automatically upon Final Acceptance, and shall be released by the City.

NOW, THEREFORE, we the Principal and _____,
as Surety, are firmly bound unto the City in the penal sum of

_____ Dollars (\$ _____)

lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents for a Procurement Term Performance Bond. The condition of this obligation is such that if the said Principal does well and faithfully perform all the conditions and covenants of the Contract before Final Acceptance of the Procurement portion of the Contract, according to the true intent and meaning thereof, upon its part to be kept and performed, then the above obligation is to be null and void, otherwise to remain in full force and effect.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal, its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements of the Procurement Term portion of the Contract before Final Acceptance, including the provisions for liquidated damages in the said Contract, any changes, additions or alterations thereof made as therein provided, on its part, to be kept and

performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the Procurement Term of the Contract or to the Procurement Term work to be performed thereunder or the specifications accompanying the same and no inadvertent overpayment of progress payments shall in any way affect its obligations on this Procurement Term Performance Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications or of any inadvertent overpayment of progress payments.

Unless the City has materially breached the Contract, the Surety's obligation under this Procurement Term Performance Bond shall arise after the City first provides notice to the Contractor and the Surety that an Event of Default has occurred under section 9.2 of the Contract and has agreed to pay the Balance of the Contract Price in accordance with the terms of the Contract to the Surety or another party at the direction of the Surety. Subsequent to receipt of such notice of the Event of Default, Surety shall make determination as to how it will proceed and advise City accordingly.

For the sake of clarity, the Balance of the Contract Price means the total amount payable by the City to the Contractor under the Contract after all proper adjustments have been made pursuant to the Contract, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

The penal sum of this Procurement Term Performance Bond shall be reduced by and to the extent of any payment or payments made by the Surety under this Procurement Term Performance Bond.

In no event shall the Surety's aggregate liability exceed the penal sum of this Procurement Term Performance Bond.

The Surety's shall have no obligation to provide the Support Term Performance Bond required under section 5.19.2 of the Contract, and the failure of the Principal to provide any Support Term Performance Bond shall not constitute a breach or default by the Surety under the terms of this Procurement Term Performance Bond or give rise to any claim or cause of action against the Surety under the terms of this Procurement Term Performance Bond.

If there is any conflict between the terms and conditions of the Procurement Term Performance Bond and the Contract, then the terms and conditions of the Procurement Term Performance Bond shall govern.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their seal this _____ day of _____, 20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

PRINCIPAL

By: _____

Its: _____

Date: _____

SURETY

By: _____

Its: _____

NOTE: Signature of Sureties must be acknowledged by a Notary Public

Date: _____

CITY

By: _____
[INSERT NAME], Controller

Date: _____

Approved as to form:
David Chiu
City Attorney

By: _____
[INSERT NAME]
Deputy City Attorney

Appendix F2
SUPPORT TERM PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that WHEREAS, the City and County of San Francisco, State of California, has awarded to:

_____ hereinafter designated as the “Principal”, a contract, dated, _____, for the City and County of San Francisco's Office of Contract Administration Contract No. _____ (the “Contract”).

WHEREAS, said Principal is required under clause 5.19.2 of the Contract to furnish to the City and County of San Francisco ("City"), 30 days before Final Acceptance of the Procurement Term portion of the Contract, a bond for the faithful performance of the Contract after Final Acceptance of the Procurement Term portion of the Contract (the “Support Term Performance Bond”) in an amount of not less than 30% of the base 10 year Total Support Fee;

WHEREAS, this Support Term Performance Bond shall be effective on the date of Final Acceptance of the Procurement Term portion of the Contract and release of the Procurement Term Performance Bond (the “Effective Date”).

WHEREAS, the term of this Support Term Performance Bond shall be a for period of five years which at the sole option and discretion of the Surety may renewed or otherwise extended.

NOW, THEREFORE, we the Principal and _____, as Surety, are firmly bound unto the City in the penal sum of _____ Dollars (\$ _____)

lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents for a Support Term Performance Bond from the Effective Date for a term of five years. The condition of this obligation is such that if the said Principal does well and faithfully perform all the conditions and covenants of the Support Term portion the Contract during the five year term of this Support Term Performance Bond, according to the true intent and meaning thereof, upon its part to be kept and performed, then the above obligation is to be null and void, otherwise to remain in full force and effect.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal, its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements of the Support Term portion of the Contract after Final Acceptance within the initial five (5) year term of this Support Term Performance Bond, and during any successive five year term in which this Support Term Performance Bond is renewed or otherwise extended, at the Surety’s sole discretion, including the provisions for liquidated damages in the said Contract, any changes, additions or alterations thereof made as therein provided, on

its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the City, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect during the initial five (5) year term, and during any renewals or extensions that have been made at the Surety's sole discretion. For the avoidance of doubt, the Surety's obligations under this Support Term Performance Bond shall only apply to the Support Term obligations from the Effective Date of this Support Term Performance Bond.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the Support Term of the Contract or to the Support Term work to be performed thereunder or the specifications accompanying the same and no inadvertent overpayment of progress payments shall in any way affect its obligations on this Support Term Performance Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications or of any inadvertent overpayment of progress payments.

Unless the City has materially breached the Contract, the Surety's obligation under this Support Term Performance Bond shall arise after the City first provides notice to the Contractor and the Surety that an event of Default has occurred under section 9.2 of the Agreement and has agreed to pay the Support Fee relating to these obligations in accordance with the terms of the Contract to the Surety or another party at the direction of the Surety. Subsequent to receipt of such notice of the Event of Default, Surety shall make determination as to how it will proceed and advise City accordingly.

In no event shall the Surety's aggregate liability exceed the penal sum of this Support Term Performance Bond.

The penal sum of this Support Term Performance Bond shall be reduced by and to the extent of any payment or payments made by the Surety under this Support Term Performance Bond.

If there is any conflict between the terms and conditions of the Support Term Performance Bond and the Contract, then the terms and conditions of the Support Term Performance Bond shall govern.

This Support Term Performance Bond shall be for the initial term of five (5) years and may be renewed or otherwise extended at the Surety's sole discretion for up to three additional successive five (5) year terms by rider or continuation certificate to the existing Support Term Performance Bond. The Surety has the option, in its sole discretion, whether to renew or otherwise extend the Support Term Performance Bond. The Surety's failure or refusal to renew or extend the term of this Support Term Performance Bond at any time shall not constitute a breach or default by the Surety under the terms of this Support Term Performance Bond or give rise to any claim or cause of action against the Surety under the terms of this Support Term Performance Bond. Additionally, the Contractor's failure to secure replacement security shall not constitute a default under this Support Term Performance Bond or give rise to any claim or cause of action against the Surety under the terms of this Support Term Performance Bond.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their seal this _____ day of _____, 20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

PRINCIPAL

By: _____

Its: _____

Date: _____

SURETY

By: _____

Its: _____

NOTE: Signature of Sureties must be acknowledged by a Notary Public

Date: _____

CITY

By: _____
[INSERT NAME], Controller

Date: _____

Approved as to form:
David Chiu
City Attorney

By: _____
[INSERT NAME]
Deputy City Attorney

Appendix G

Federal Contract Requirements

I. DEFINITIONS

- A. Approved Project Budget** means the most recent statement, approved by the FTA, of the costs of the Project, the maximum amount of Federal assistance for which the City is currently eligible, the specific tasks (including specified contingencies) covered, and the estimated cost of each task.
- B. Contractor** means the individual or entity awarded a third-party contract financed in whole or in part with Federal assistance originally derived from FTA.
- C. Cooperative Agreement** means the instrument by which FTA awards Federal assistance to a specific Recipient to support a particular Project or Program, and in which FTA takes an active role or retains substantial control.
- D. Federal Transit Administration (FTA)** is an operating administration of the U.S. DOT.
- E. FTA Directive** includes any FTA circular, notice, order or guidance providing information about FTA's programs, application processing procedures, and Project management guidelines. In addition to FTA directives, certain U.S. DOT directives also apply to the Project.
- F. Grant Agreement** means the instrument by which FTA awards Federal assistance to a specific Recipient to support a particular Project, and in which FTA does not take an active role or retain substantial control, in accordance with 31 U.S.C. § 6304.
- G. Government** means the United States of America and any executive department or agency thereof.
- H. Project** means the task or set of tasks listed in the Approved Project Budget, and any modifications stated in the Conditions to the Grant Agreement or Cooperative Agreement applicable to the Project. In the case of the formula assistance program for urbanized areas, for elderly and persons with disabilities, and non-urbanized areas, 49 U.S.C. §§ 5307, 5310, and 5311, respectively, the term "Project" encompasses both "Program" and "each Project within the Program," as the context may require, to effectuate the requirements of the Grant Agreement or Cooperative Agreement.
- I. Recipient** means any entity that receives Federal assistance directly from FTA to accomplish the Project. The term "Recipient" includes each FTA "Grantee" as well as each FTA Recipient of a Cooperative Agreement. For the purpose of this Agreement, Recipient is the City.
- J. Secretary** means the U.S. DOT Secretary, including his or her duly authorized designee.

- K. Third Party Contract** means a contract or purchase order awarded by the Recipient to a vendor or contractor, financed in whole or in part with Federal assistance awarded by FTA.
- L. Third Party Subcontract** means a subcontract at any tier entered into by Contractor or third party subcontractor, financed in whole or in part with Federal assistance originally derived from FTA.
- M. U.S. DOT** is the acronym for the U.S. Department of Transportation, including its operating administrations.

II. FEDERAL CHANGES

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between the City and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

III. ACCESS TO RECORDS

- A.** The Contractor agrees to provide the City and County of San Francisco, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this Agreement for the purposes of making audits, examinations, excerpts and transcriptions.
- B.** The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
- C.** The Contractor agrees to maintain all books, records, accounts and reports required under this Agreement for a period of not less than three years after the date of termination or expiration of this Agreement, except in the event of litigation or settlement of claims arising from the performance of this Agreement, in which case Contractor agrees to maintain same until the City, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. 49 CFR 18.36(i)(11).

IV. DEBARMENT AND SUSPENSION

- A.** The Contractor shall comply and facilitate compliance with U.S. DOT regulations, "Nonprocurement Suspension and Debarment," 2 C.F.R. part 1200, which adopts and supplements the U.S. Office of Management and Budget (U.S. OMB) "Guidelines to Agencies on Governmentwide Debarment and Suspension (Nonprocurement)," 2 C.F.R. part 180. These provisions apply to each contract at any tier of \$25,000 or more, and to each contract at any tier for a federally required audit (irrespective of the contract amount), and to each contract at any tier that must be approved by an FTA official irrespective of the contract amount. As such, the Contractor shall verify that its principals, affiliates, and subcontractors are eligible to participate in this federally funded contract and are not presently declared by any Federal department or agency to be:

- a) Debarred from participation in any federally assisted Award;
- b) Suspended from participation in any federally assisted Award;
- c) Proposed for debarment from participation in any federally assisted Award;
- d) Declared ineligible to participate in any federally assisted Award;
- e) Voluntarily excluded from participation in any federally assisted Award; or
- f) Disqualified from participation in any federally assisted Award.

See Appendix D, Certification Regarding Debarment, Suspension, and Other Responsibility Matters.

- B.** The Contractor agrees to include a provision in its lower-tier covered transactions requiring lower-tier participants to comply with the requirements of 2 CFR Part 180, Subpart C, and Part 1200, Subpart C.

V. NO FEDERAL GOVERNMENT OBLIGATIONS TO CONTRACTOR

- A.** The City and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the City, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.
- B.** The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

VI. CIVIL RIGHTS

- A. Nondiscrimination** – In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 41 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

- B. Equal Employment Opportunity** – The following equal employment opportunity requirements apply to the underlying contract:

- 1. Race, Color, Creed, National Origin, Sex** – In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOT) regulations, “Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor,” 41 CFR Parts 60 et seq., (which implement Executive Order No. 11246, “Equal Employment Opportunity,” as

amended by Executive Order No. 11375, “Amending Executive Order 11246 Relating to Equal Employment Opportunity,” 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

2.Age – In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

3.Disabilities – In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, “Regulations to Implement the Equal Employment Provisions of the Americans with Disabilities Act,” 29 CFR Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

C. The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

VII. DBE/SBE ASSURANCES

Pursuant to 49 C.F.R. Section 26.13, the Contractor is required to make the following assurance in its agreement with SFMTA and to include this assurance in any agreements it makes with subcontractors in the performance of this contract:

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor or Subcontractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as SFMTA deems appropriate.

VIII. PATENT RIGHTS (*applicable to contracts for experimental, research, or development projects financed by FTA*)

A. General. If any invention, improvement, or discovery is conceived or first actually reduced to practice in the course of or under this Agreement, and that invention,

improvement, or discovery is patentable under the laws of the United States of America or any foreign country, the City and Contractor agree to take actions necessary to provide immediate notice and a detailed report to the FTA.

- B. Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (large business, small business, state government or instrumentality, local government, nonprofit organization, institution of higher education, individual), the City and Contractor agree to take the necessary actions to provide, through FTA, those rights in that invention due the Federal Government described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 CFR Part 401.
- C. The Contractor also agrees to include the requirements of this clause in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

IX. RIGHTS IN DATA AND COPYRIGHTS (*Applicable to contracts for planning, research, or development financed by FTA*)

- A. **Definition.** The term "subject data" used in this section means recorded information, whether or not copyrighted, that is delivered or specified to be delivered under this Agreement. The term includes graphic or pictorial delineation in media such as drawings or photographs; text in specifications or related performance or design-type documents; machine forms such as punched cards, magnetic tape, or computer memory printouts; and information retained in computer memory. Examples include, but are not limited to, computer software, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term "subject data" does not include financial reports, cost analyses, and similar information incidental to contract administration.
- B. **Federal Restrictions.** The following restrictions apply to all subject data first produced in the performance of this Agreement.
 - 1. **Publication of Data.** Except for its own internal use in conjunction with the Agreement, Contractor may not publish or reproduce subject data in whole or in part, or in any manner or form, nor may Contractor authorize others to do so, without the written consent of the Federal Government, until such time as the Federal Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to any contract with an academic institution.
 - 2. **Federal License.** The Federal Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, "for Federal Government purposes," any subject data or copyright described below. As used in the previous sentence, "for Federal Government purposes" means use only for the direct purposes of the Federal Government. Without the copyright owner's consent, the Federal Government may not extend its Federal license to any other party:

- a. Any subject data developed under this Agreement, whether or not a copyright has been obtained; and
 - b. Any rights of copyright purchased by City or Contractor using Federal assistance in whole or in part provided by FTA.
3. **FTA Intention.** When FTA awards Federal assistance for an experimental, research or developmental work, it is FTA's general intention to increase transportation knowledge available to the public, rather than to restrict the benefits resulting from the work to participants in the work. Therefore, unless FTA determines otherwise, the Contractor performing experimental, research, or developmental work required by the underlying Agreement agrees to permit FTA to make available to the public, either FTA's license in the copyright to any subject data developed in the course of the Agreement, or a copy of the subject data first produced under the Agreement for which a copyright has not been obtained. If the experimental, research, or developmental work which is the subject of this Agreement is not completed for any reason whatsoever, all data developed under this Agreement shall become subject data as defined in Subsection a. above and shall be delivered as the Federal Government may direct. This subsection does not apply to adaptations of automatic data processing equipment or programs for the City's use the costs of which are financed with Federal transportation funds for capital projects.
4. **Hold Harmless.** Unless prohibited by state law, upon request by the Federal Government, the Contractor agrees to indemnify, save, and hold harmless the Federal Government, its officers, agents, and employees acting within the scope of their official duties, against any liability, including costs and expenses, resulting from any willful or intentional violation by the Contractor of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under this Agreement. The Contractor shall not be required to indemnify the Federal Government for any such liability arising out of the wrongful acts of employees or agents of the Federal Government.
5. **Restrictions on Access to Patent Rights.** Nothing contained in this section on rights in data shall imply a license to the Federal Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Federal Government under any patent.
6. **Application to Data Incorporated into Work.** The requirements of Subsections (2), (3) and (4) of this Section do not apply to data developed by the City or Contractor and incorporated into the work carried out under this Agreement, provided that the City or Contractor identifies the data in writing at the time of delivery of the work.
7. **Application to Subcontractors.** Unless FTA determines otherwise, the Contractor agrees to include these requirements in each subcontract for

experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

C. Flow Down. The Contractor also agrees to include these requirements in each subcontract for experimental, developmental, or research work financed in whole or in part with Federal assistance provided by FTA.

D. Provision of Rights to Government. Unless the Federal Government later makes a contrary determination in writing, irrespective of the Contractor's status (large business, small business, state government or instrumentality, local government, nonprofit organization, institution of higher education, individual, etc.), the City and Contractor agree to take the necessary actions to provide, through FTA, those rights in that invention due the Federal Government described in U.S. Department of Commerce regulations, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," 37 CFR Part 401.

X. CONTRACT WORK HOURS AND SAFETY STANDARDS (*applicable to nonconstruction contracts in excess of \$100,000 that employ laborers or mechanics on a public work*)

A. Overtime requirements – No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

B. Violation; liability for unpaid wages; liquidated damages – In the event of any violation of the clause set forth in paragraph A of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph A of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph A of this section.

C. Withholding for unpaid wages and liquidated damages – The City and County of San Francisco shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any

liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

- D. Subcontracts** – The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs A through D of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs A through D of this section.

XI. ENERGY CONSERVATION REQUIREMENTS

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

XII. CLEAN WATER REQUIREMENTS (*applicable to all contracts in excess of \$100,000*)

- A.** The Contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251 et seq. Contractor agrees to report each violation of these requirements to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA regional office.
- B.** The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

XIII. CLEAN AIR (*applicable to all contracts and subcontracts in excess of \$100,000, including indefinite quantities where the amount is expected to exceed \$100,000 in any year.*)

- A.** Contractor agrees to comply with applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to the City and understands and agrees that the City will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.
- B.** The Contractor also agrees to include these requirements in each subcontract exceeding \$100,000 financed in whole or in part with Federal assistance provided by FTA.

XIV. PRIVACY

If Contractor or its employees administer any system of records on behalf of the Federal Government, Contractor and its employees agree to comply with the information restrictions and other applicable requirements of the Privacy Act of 1974, 5 U.S.C. § 552a (the Privacy Act). Specifically, Contractor agrees to obtain the express consent of the Federal Government before the Contractor or its employees operate a system of records on behalf of the Government. Contractor acknowledges that the requirements of

the Privacy Act, including the civil and criminal penalties for violations of the Privacy Act, apply to those individuals involved, and that failure to comply with the terms of the Privacy Act may result in termination of this Agreement. The Contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

XV. DRUG AND ALCOHOL TESTING

To the extent Contractor, its subcontractors or their employees perform a safety-sensitive function under the Agreement, Contractor agrees to comply with, and assure compliance of its subcontractors, and their employees, with 49 U.S.C. § 5331, and FTA regulations, “Prevention of Alcohol Misuse and Prohibited Drug Use in Transit Operations,” 49 CFR Part 655.

XVI. TERMINATION FOR CONVENIENCE OF CITY *(required for all contracts in excess of \$10,000)*

See Agreement Terms and Conditions.

XVII. TERMINATION FOR DEFAULT *(required for all contracts in excess of \$10,000)*

See Agreement Terms and Conditions.

XVIII. BUY AMERICA

The Contractor agrees to comply with 49 U.S.C. 5323(j) and 49 CFR Part 661, which provide that Federal funds may not be obligated unless steel, iron, manufactured products, and construction materials (*excluding* cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives) used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. “Construction materials” include an article, material, or supply that is or consists primarily of:

- Non-ferrous metals;
- Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- Glass (including optic glass);
- Lumber; or
- Drywall.

General waivers are listed in 49 CFR 661.7, and include microcomputer equipment, software, and small purchases (\$150,000 or less) made with capital, operating, or planning funds. Separate requirements for rolling stock are set out at 49 U.S.C. 5323(j)(2)(C) and 49 CFR 661.11. Rolling stock not subject to a general waiver must be manufactured in the United States and have a 70 percent domestic content.

XIX. PROHIBITION AGAINST USE OF CONTRACT FUNDS FOR COVERED TELECOMMUNICATIONS EQUIPMENT

Under 2 CFR Section 216, Contractors and Subcontractors are prohibited from using Contract funds to:

- A. Procure or obtain;
- B. Extend or renew a contract to procure or obtain; or
- C. Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Section 889 of Public Law 115-232, covered telecommunications equipment is:
 - 1. Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
 - 2. For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
 - 3. Telecommunications or video surveillance services provided by such entities or using such equipment.
 - 4. Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

XX. CARGO PREFERENCE - USE OF UNITED STATES FLAG VESSELS

The Contractor agrees: (a) to use privately owned United States-Flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying Agreement to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels; (b) to furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of leading for shipments originating outside the United States, a legible copy of a rated, “on-board” commercial ocean bill-of-lading in English for each shipment of cargo described above to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the Contractor in the case of a subcontractor’s bill-of-lading.); and (c) to include these requirements in all subcontracts issued pursuant to this Agreement when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

XXI. RECYCLED PRODUCTS

The Contractor agrees to comply with all the requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including, but not limited to, the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.

XXII. PRE-AWARD AND POST-DELIVERY AUDIT REQUIREMENTS *(applies to contracts for rolling stock)*

To the extent applicable, Contractor agrees to comply with the requirements of 49 U.S.C. § 5323(l) and FTA implementing regulations at 49 CFR Part 663, and to submit the following certifications:

- A. **Buy America Requirements:** The Contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the Bidder/Offeror certifies compliance with Buy America, it shall submit documentation which lists (1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and (2) the location of the final assembly point for the rolling stock, including a description of the activities that are planned to take place and actually took place at the final assembly point and the cost of final assembly.
- B. **Solicitation Specification Requirements:** The Contractor shall submit evidence that it will be capable of meeting the bid specifications and provide information and access to Recipient and its agents to enable them to conduct post-award and post-delivery audits.
- C. **Federal Motor Vehicle Safety Standards (FMVSS):** The Contractor shall submit (1) manufacturer's FMVSS self-certification sticker **information** that the vehicle complies with relevant FMVSS or (2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

XXIII. FALSE OR FRAUDULENT STATEMENTS AND CLAIMS

- A. The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. §§ 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 CFR Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying Agreement, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA-assisted Project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.
- B. The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal

Government under a contract connected with a Project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

- C. The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

XXIV. FLY AMERICA

The Contractor agrees to comply with 49 U.S.C. 40118 (the “Fly America” Act) in accordance with the General Services Administration’s regulations at 41 CFR Part 301-10, which provide that recipients and subrecipients of Federal funds and their contractors are required to use U.S. Flag air carriers for U.S. Government-financed international air travel and transportation of their personal effects or property, to the extent such service is available, unless travel by foreign air carrier is a matter of necessity, as defined by the Fly America Act. The Contractor shall submit, if a foreign air carrier was used, an appropriate certification or memorandum adequately explaining why service by a U.S. flag air carrier was not available or why it was necessary to use a foreign air carrier and shall, in any event, provide a certificate of compliance with the Fly America requirements. The Contractor agrees to include the requirements of this section in all subcontracts that may involve international air transportation.

XXV. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

The preceding provisions include, in part, certain Standard Terms and Conditions required by DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by DOT, as set forth in FTA Circular 4220.1F, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any (name of grantee) requests which would cause (name of grantee) to be in violation of the FTA terms and conditions.

XXVI. TRANSIT EMPLOYEE PROTECTIVE AGREEMENTS *(applicable to each contract for transit operations performed by employees of a Contractor recognized by FTA to be a transit operator)*

- A. The Contractor agrees to the comply with applicable transit employee protective requirements as follows:

- 1. **General Transit Employee Protective Requirements** – To the extent that FTA determines that transit operations are involved, the Contractor agrees to carry out the transit operations work on the underlying contract in compliance with terms and conditions determined by the U.S. Secretary of Labor to be fair and equitable to protect the interests of employees employed under this

contract and to meet the employee protective requirements of 49 U.S.C. A 5333(b), and U.S. DOL guidelines at 29 C.F.R. Part 215, and any amendments thereto. These terms and conditions are identified in the letter of certification from the U.S. DOL to FTA applicable to the FTA Recipient's Project from which Federal assistance is provided to support work on the underlying contract. The Contractor agrees to carry out that work in compliance with the conditions stated in that U.S. DOL letter. The requirements of this subsection A, however, do not apply to any contract financed with Federal assistance provided by FTA either for projects for elderly individuals and individuals with disabilities authorized by 49 U.S.C. § 5310(a)(2), or for projects for nonurbanized areas authorized by 49 U.S.C. § 5311. Alternate provisions for those projects are set forth in subsections (2) and (3) of this clause.

2. Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5310(a)(2) for Elderly Individuals and Individuals with Disabilities

– If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5310(a)(2), and if the U.S. Secretary of Transportation has determined or determines in the future that the employee protective requirements of 49 U.S.C. § 5333(b) are necessary or appropriate for the state and the public body subrecipient for which work is performed on the underlying contract, the Contractor agrees to carry out the Project in compliance with the terms and conditions determined by the U.S. Secretary of Labor to meet the requirements of 49 U.S.C. § 5333(b), U.S. DOL guidelines at 29 C.F.R. Part 215, and any amendments thereto. These terms and conditions are identified in the U.S. DOL's letter of certification to FTA, the date of which is set forth Grant Agreement or Cooperative Agreement with the state. The Contractor agrees to perform transit operations in connection with the underlying contract in compliance with the conditions stated in that U.S. DOL letter.

3. Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5311 in Nonurbanized Areas

– If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5311, the Contractor agrees to comply with the terms and conditions of the Special Warranty for the Nonurbanized Area Program agreed to by the U.S. Secretaries of Transportation and Labor, dated May 31, 1979, and the procedures implemented by U.S. DOL or any revision thereto.

- B.** The Contractor also agrees to include the any applicable requirements in each subcontract involving transit operations financed in whole or in part with Federal assistance provided by FTA.

XXVII. NATIONAL ITS ARCHITECTURE POLICY (*Applicable to contracts for ITS projects*)

If providing Intelligent Transportation Systems (ITS) property or services, Contactor shall comply with the National ITS Architecture and standards to the extent required by 23 U.S.C. § 512, FTA Notice, "FTA National ITS Architecture Policy on Transit

Projects,” 66 FR 1455, et seq., January 8, 2001, and later published policies or implementing directives FTA may issue.

XXVIII. TEXTING WHILE DRIVING; DISTRACTED DRIVING

Consistent with Executive Order 13513 “Federal Leadership on Reducing Text Messaging While Driving”, Oct. 1, 2009 (available at <http://edocket.access.gpo.gov/2009/E9-24203.htm>) and DOT Order 3902.10 “Text Messaging While Driving”, Dec. 30, 2009, SFMTA encourages Contractor to promote policies and initiatives for employees and other personnel that adopt and promote safety policies to decrease crashes by distracted drivers, including policies to ban text messaging while driving, and to include this provision in each third party subcontract involving the Project.

XXIX. SEAT BELT USE

In compliance with Executive Order 13043 “Increasing Seat Belt Use in the United States,” April 16, 1997, 23 U.S.C. Section 402 note, the SFMTA encourages Contractor to adopt and promote on-the-job seat belt use policies and programs for its employees and other personnel that operate company owned, rented, or personally operated vehicles, and to include this provision in each third party subcontract involving the Project.

XXX. LOBBYING (*To be submitted with each bid or offer exceeding \$100,000*)

Certification Regarding Lobbying required (See Appendix E).

XXXI. PROMPT PAYMENT

A. In accordance with SFMTA’s SBE/DBE Program, no later than three days from the date of Contractor’s receipt of progress payments by SFMTA, the Contractor shall pay any subcontractors for work that has been satisfactorily performed by said subcontractors. Unless the prime Contractor notifies the CCO Director in writing within 10 working days prior to receiving payment from the City that there is a bona fide dispute between the prime Contractor and the subcontractor. Within five working days of such payment, Contractor shall provide City with a declaration under penalty of perjury that it has promptly paid such subcontractors for the work they have performed. Failure to provide such evidence shall be cause for City to suspend future progress payments to Contractors.

B. Contractor may withhold retention from subcontractors if City withholds retention from Contractor. Should retention be withheld from Contractor, within 30 days of City’s payment of retention to Contractor for satisfactory completion of all work required of a subcontractor, Contractor shall release any retention withheld to the subcontractor. Satisfactory completion shall mean when all the tasks called for in the subcontract with subcontractor have been accomplished and documented as required by City. If the Contractor does not pay its subcontractor as required under the above paragraph, it shall pay interest to the subcontractor at the legal rate set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure.

XXXII. VETERANS EMPLOYMENT (*applicable to Capital Projects*)

As provided by 49 U.S.C. § 5325(k):

A. To the extent practicable, Contractor agrees that it:

1. Will give a hiring preference to veterans (as defined in 5 U.S.C. § 2108), who have the skills and abilities required to perform construction work required under a third party contract in connection with a capital Project supported with funds made available or appropriated for 49 U.S.C. chapter 53, and
2. Will not require an employer to give a preference to any veteran over any equally qualified applicant who is a member of any racial or ethnic minority, female, an individual with a disability, or a former employee, and

B. Contractor also assures that its subcontractor will:

1. Will give a hiring preference to veterans (as defined in 5 U.S.C. § 2108), who have the skills and abilities required to perform construction work required under a third party contract in connection with a capital Project supported with funds made available or appropriated for 49 U.S.C. chapter 53, to the extent practicable, and

Will not require an employer to give a preference to any veteran over any equally qualified applicant who is a member of any racial or ethnic minority, female, an individual with a disability, or a former employee.

Appendix H

SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY SMALL BUSINESS ENTERPRISE PROGRAM REQUIREMENTS

Architects, Engineers, Planners, and Environmental Scientists and Other Professional Services

I. POLICY

The San Francisco Municipal Transportation Agency (SFMTA), recipient of federal financial assistance from the Federal Transit Administration (FTA), is committed to and has adopted, a Small Business Enterprise (SBE) and Disadvantaged Business Enterprise (DBE) Program to implement the Disadvantaged Business Enterprise regulations in 49 C.F.R. Part 26 (the "Regulations"), issued by the Department of Transportation (DOT).

It is the policy of the SFMTA to ensure nondiscrimination in the award and administration of DOT-assisted contracts and to create a level playing field on which SBEs and DBEs can compete fairly for contracts and subcontracts relating to SFMTA's construction, procurement and professional services activities. To this end, SFMTA has developed procedures to remove barriers to SBE and DBE participation in the bidding and award process and to assist SBEs and DBEs to develop and compete successfully outside of the SBE/DBE program. In connection with the performance of this contract, the Contractor will cooperate with SFMTA in meeting these commitments and objectives.

Pursuant to 49 C.F.R. Section 26.13, the Contractor is required to make the following assurance in its agreement with SFMTA and to include this assurance in any agreements it makes with subcontractors in the performance of this contract:

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor or subcontractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as SFMTA deems appropriate.

A. Applicability

Under 49 CFR Sections 26.3 and 26.51, and in response to the Federal Transit Administration's (FTA) March 23, 2006, publication of the Department of Transportation's (DOT) guidance concerning the federal DBE program that applies to grant recipients within the Ninth Circuit, the SFMTA, a recipient of federal financial assistance from the FTA, is required to implement race-neutral means of facilitating DBE participation in instances where the SFMTA lacks evidence of discrimination or its effects on DBEs. Per DOT requirements, the SFMTA conducted a disparity study to determine if substantial disparities exist in the utilization of DBEs in the SFMTA's federally existed contracts. The results of the study concluded that for the

SFMTA's professional services contracts, DBEs owned by women are underutilized, and DOT has authorized the SFMTA to establish contract goals for women-owned DBEs. The Regulations are incorporated into this Program as though fully set forth herein. This Program applies to all SFMTA contracts that are funded, in whole or in part, by DOT federal financial assistance.

B. Objectives

The objectives of this program are to:

1. Remove barriers to SBE and DBE participation in the bidding, award and administration of SFMTA contracts;
2. Assist SBEs and DBEs to develop and compete successfully outside of the Program;
3. Ensure that the Program is narrowly tailored in accordance with 49 C.F.R. Part 26;
4. Ensure that only SBEs and DBEs meeting the eligibility requirements are allowed to participate as SBEs and DBEs;
5. Identify business enterprises that are qualified as SBEs and DBEs and are qualified to provide SFMTA with required materials, equipment, supplies and services; and to develop a good rapport with the owners, managers and sales representatives of those enterprises;
6. Develop communications programs and procedures which will acquaint prospective SBEs and DBEs with SFMTA's contract procedures, activities and requirements and allow SBEs and DBEs to provide SFMTA with feedback on existing barriers to participation and effective procedures to eliminate those barriers; and
7. Administer the Program in close coordination with the various divisions within SFMTA so as to facilitate the successful implementation of this Program.

C. Administration of Program

The Director of Transportation is responsible for adherence to this policy. The DBE Liaison Officer (DBELO) shall be responsible for the development, implementation and monitoring of this program. It is the expectation of the Municipal Transportation Board of Directors and the Director of Transportation that all SFMTA personnel shall adhere to the provisions and the spirit of this program.

D. Prohibited Discrimination

SFMTA shall not exclude persons from participation in, deny benefits to, or otherwise discriminate against any persons in connection with the award and performance of any contract governed by the Regulations on the basis of race, color, sex or national origin. The City and County of San Francisco also prohibits discrimination on the basis of (the fact or perception of a person's) race, color, creed, religion, national origin, ancestry, age, sex, sexual orientation,

gender identity, domestic partner status, marital status, disability or Acquired Immune Deficiency Syndrome or HIV status (AIDS/HIV status).

E. SFMTA shall not directly or through contractual or other arrangements, use criteria or methods of administration that have the effect of defeating or substantially impairing accomplishment of the objectives of this program with respect to individuals in the groups or categories or having the characteristics listed above.

F. SFMTA has signed the federal assurances regarding non-discrimination required under 49 C.F.R. Section 26.13. See III.D (Contract Assurances) for requirements of Contractor and Subconsultants.

II. DEFINITIONS

Any terms used in SFMTA's SBE/DBE Program that are defined in 49 C.F.R. Section 26.5 or elsewhere in the Regulations shall have the meaning set forth in the Regulations.

A. Disadvantaged Business Enterprise (DBE): A DBE is a for-profit, small business concern (1) that is at least 51% owned by one or more individuals who are both socially and economically disadvantaged, or, in the case of a corporation, in which 51% of the stock is owned by one or more socially and economically disadvantaged individuals; (2) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it; and (3) that is certified under the California Unified Certification Program.

B. Small Business Enterprise (SBE): An SBE is a for-profit, small business concern with a three-year average gross revenue not exceeding current SBA size standards appropriate for its type of work and is either verified eligible by the SFMTA or the State of California's Small Business Program with the Department of General Services, the California Unified Certification Program with a U.S. Department of Transportation recipient, or the City and County of San Francisco's LBE program with the Contract Monitoring Division.

III. SBE/DBE PARTICIPATION AND SUBCONTRACTING REQUIREMENTS

A. SBE and DBE Participation Goals

The following participation goals have been established for this Contract:

SBE	5%
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This goal will apply to the following types of contracts or scope of work in the contract: Construction – Building, Heavy; Construction-Dredging and Surface Cleanup; Construction (specialty trades); General Freight Trucking; Hazardous Waste Collection, Trucking; Remediation; Testing Labs; Computer Programming and Design; Architecture & Engineering services (to include professional and technical services); Surveying and Mapping; Drafting (Design Services); Landscape Architecture; Building Inspection; Machinery and Equipment Rental (Construction); Merchant Wholesalers, Durable Goods; Public Relations; and Telecommunications.

B. Determining the Amount of SBE and DBE Participation

The SFMTA strongly encourages the prime contractor to make every good faith effort to include SBEs and DBEs to perform meaningful work in all aspects of the projects. To accomplish this goal, the following guidance is provided:

1. SBE and DBE Participation

SBE and DBE participation includes contracts (other than employee contracts) with SBEs and DBEs for any goods or services specifically required for the completion of the work under the Agreement. An SBE or DBE may participate as a prime contractor/consultant, subcontractor/consultant, joint venture partner with a prime or consultant, vendor of material or supplies incorporated or expended in the work, or a supplier of other services such as shipping, transportation, testing, equipment rental, insurance services and other support services necessary to fulfill the requirements of the Agreement.

2. Function

SBEs and DBEs must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of work and must carry out its responsibility by actually performing, managing and supervising the work. However, an SBE or DBE may contract out a portion of the work if it is considered to be a normal industry practice. If an SBE or DBE contractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of normal industry practices, the SBE or DBE shall be presumed not to be performing a commercially useful function.

3. Determining the amount of SBE and DBE Participation

SBE and DBE participation includes that portion of the contract work actually performed by a certified SBE or DBE with its own forces. An SBE or DBE may participate as a prime contractor, subcontractor, joint venture partner, or vendor or supplier of materials or services required by the contract.

An SBE's or DBE's participation can only be counted if it is performing a commercially useful function. An SBE or DBE is performing a commercially useful function when it actually performs, manages and supervises a portion of the work involved. There is a rebuttable presumption that if the SBE or DBE is not responsible for at least 30 percent of the work with its own forces, or subcontracts a greater portion of the work than the normal industry standard, it is not performing a commercially useful function.

The Contractor shall determine the amount of SBE and DBE participation for each SBE and DBE performing work on the contract in terms of both the total value of the work in dollars and the percentage of the total contract bid price. The Contractor shall also determine the total amount of SBE and DBE participation for the entire contract. The Contractor shall count SBE and DBE participation according to the following guidelines:

a. SBE or DBE Prime Contractor

Count the entire dollar amount of the work performed or services provided by the SBE's or DBE's own forces, including the cost of materials and supplies obtained for the work and the reasonable fees and commissions charged for the services. Do not count any work

subcontracted to another firm as SBE or DBE participation by the SBE or DBE Prime Contractor.

b. SBE or DBE Subcontractor

Count the entire amount of the work performed or services provided by the SBE's or DBE's own forces, including the cost of materials and supplies obtained for the work (except for materials and supplies purchased or leased from the Prime Contractor) and reasonable fees and commissions charged for the services. Do not count any work subcontracted by an SBE or DBE subcontractor to another firm as SBE or DBE participation by said SBE or DBE subcontractor. If the work has been subcontracted to another SBE or DBE, it will be counted as SBE or DBE participation by that other SBE or DBE.

c. SBE or DBE Joint Venture Partner

Count the portion of the work that is performed solely by the SBE's or DBE's forces or if the work is not clearly delineated between the SBE or DBE and the joint venture partner, count the portion of the work equal to the SBE's or DBE's percentage of ownership interest in the joint venture.

d. SBE or DBE Regular Dealer

Count 60 percent of the costs of materials and supplies obtained from an SBE or DBE regular dealer that owns, operates or maintains a store or warehouse in which the materials and supplies are regularly bought, kept in stock and sold or leased to the public in the usual course of business (except regular dealers of bulk items such as petroleum, cement and gravel who own and operate distribution equipment in lieu of maintaining a place of business). This applies whether an SBE or DBE is a prime contractor or subcontractor.

e. Other SBEs or DBEs

Count the entire amount of fees or commissions charged for assistance in procuring or delivering materials and supplies when purchased from an SBE or DBE that is not a manufacturer or regular dealer. Do not count the cost of the materials and supplies.

C. Submission of Certification for SBEs and DBEs

All firms wishing to receive credit for participation under the SFMTA's SBE/DBE Program must be certified as bona fide SBEs or DBEs with the SFMTA. This requires either submission of: (1) the completed certification applications for either SBEs, DBEs, or LBEs, or (2) submission of the SFMTA's small business verification application. For information regarding where to obtain applications for these certifications, please contact the SFMTA Contract Compliance Office at:

San Francisco Municipal Transportation Agency
Contract Compliance Office
One South Van Ness Avenue, 6th floor
San Francisco, California 94103
Attn: Todd Senigar
todd.senigar@sfmta.com

D. Contract Assurances

The Contractor and its subcontractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of the contract. The Contractor and its subcontractors shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to: (1) withholding monthly progress payments; (2) assessing sanctions; (3) liquidated damages; and/or (4) disqualifying the contractor from future bidding as non-responsible.

E. Use of SBE and DBE Firms

The Consultant shall use the specific SBEs and DBEs listed to perform the work and supply the materials for which each is listed unless the Consultant obtains CCO's prior written consent. Unless prior written consent by CCO is provided, the Consultant shall not be entitled to any payment for work or material unless it is performed or supplied by the listed SBE or DBE.

F. Substitution of Subconsultants and Suppliers

The Consultant shall not terminate an SBE or DBE subconsultant or supplier for convenience and then perform the work with its own forces. Before requesting the termination and/or substitution of an SBE or DBE subconsultant, the Consultant must give notice in writing to the SBE or DBE subconsultant, with a copy to CCO, of its intent to request to terminate and/or substitute, and the reason for the request. The Consultant must give the SBE or DBE five days to respond to the notice and advise CCO and the Consultant of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Consultant's request should not be approved. CCO must approve the request in writing in order for the substitution to be valid. The substitution may also have to be approved by the SFMTA Board of Directors.

When an SBE or DBE subconsultant is terminated as provided in this section, or fails to complete its work on the contract for any reason, the Consultant shall make good faith efforts to find another SBE or DBE subconsultant to substitute for the original SBE or DBE. These good faith efforts shall be directed at finding another SBE or DBE to perform at least the same amount of work under the contract as the SBE or DBE that was terminated, to the extent needed to meet the established SBE or DBE contract goal.

G. Addition of Subconsultants and Suppliers

The Consultant shall notify CCO prior to any addition of an SBE/DBE or non-SBE/non-DBE subconsultant or supplier to the project. Submit SBE/DBE SFMTA Form No. 4 for each new SBE or DBE subconsultant or supplier. Any new SBE or DBE subconsultant or supplier approved by CCO also must submit SFMTA SBE/DBE Form No. 5.

H. Prompt Payment to Subcontractors

In accordance with SFMTA's SBE/DBE Program, no later than three days from the date of Contractor's receipt of progress payments by SFMTA, the Contractor shall pay any subcontractors for work that has been satisfactorily performed by said subconsultants. Unless the prime consultant notifies the CCO Director in writing within 10 working days prior to

receiving payment from the City that there is a bona fide dispute between the prime consultant and the subconsultant. Within five working days of such payment, Consultant shall provide City with a declaration under penalty of perjury that it has promptly paid such subconsultants for the work they have performed. Failure to provide such evidence shall be cause for City to suspend future progress payments to Consultants. Effective January 1, 2019, the CCO will implement an online contract compliance monitoring system, B2GNow. If this contract is awarded after implementation of B2GNow, rather than completing and submitting SBE/DBE Form No. 7, the Consultant shall enter its subconsultant payment information into the B2GNow system. Subconsultants are then required to acknowledge payment from the Consultant online using the B2GNow system. B2GNow system training will be made available to the Consultant and its subconsultants.

Consultant may withhold retention from subconsultants if City withholds retention from Consultant. Should retention be withheld from Consultant, within 30 days of City's payment of retention to Consultant for satisfactory completion of all work required of a subconsultant, Contractor shall release any retention withheld to the subconsultant. Satisfactory completion shall mean when all the tasks called for in the subcontract with subconsultant have been accomplished and documented as required by City.

If the Consultant does not pay its subconsultant as required under the above paragraph, it shall pay interest to the subconsultant at the legal rate set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure.

IV. MONITORING AND COMPLIANCE

A. SBE and DBE Records; Reporting Requirements

The Contractor shall maintain records of all SBE and DBE participation in the performance of the contract including subcontracts entered into with certified SBEs and DBEs and all materials purchased from certified SBEs and DBEs.

The Contractor shall submit SBE and DBE participation reports to SFMTA on a monthly basis, or as otherwise directed by the CCO. The reports shall identify the name and address of each SBE and DBE performing work on the project, and show the total dollar amount requested for payment and the total dollar amount actually paid to each SBE and DBE. Within thirty (30) days of completion of the contract, or as otherwise directed by the CCO, the Contractor shall submit a final summary SBE/DBE report to the CCO.

B. Noncompliance; Administrative Remedies

SFMTA will implement appropriate mechanisms to ensure that its prime contractors and subcontractors comply with SBE/DBE Program regulatory requirements. SFMTA will apply legal and contractual remedies available under federal, state and local law.

SFMTA will also include a monitoring and enforcement mechanism to verify that the work committed to SBEs and DBEs at contract award is actually performed by the SBEs and DBEs. This mechanism will provide for a running tally of actual SBE and DBE attainments and include a provision ensuring that SBE and DBE participation is credited toward overall or contract goals only when payments are actually made to SBE and DBE firms.

Appendix I
Performance and Service Level Requirements

II Performance Requirements. The Contractor shall design and implement the CBTC System and provide Services to support the CBTC System so that it meets the Performance Requirements listed in this Appendix I, Table 1.

II.1 Use of Performance Requirements. The Performance Targets marked with an asterisk (*) in this Appendix I, Table 1 shall be used to calculate the Performance-Based Monthly Support Fee as described in Appendix B Section B2.2.4 (Calculation of Performance-Based Monthly Support Fee Adjustments).

Table 1: Performance Requirements

Row	Performance Metric	Calculation	Target
1	Lost Minutes per Year (minutes)	Calculated as specified in the Contract Specifications (Appendix A), Section 30 (Reliability, Availability, Maintainability (RAM))	1248
2	System Availability (X)*		99.96%
3	Minimum System Mean Time Between Failures (hours)		12,430
4	Mean Uptime (hours)		6,932
5	Mean Corrective Maintenance Time (MCMT) (hours)		0.45
6	Maximum Mean Corrective Maintenance Time (MCMT _{MAX95}) (hours)		1
7	Mean Time to Restore (minutes)		2
8	Maximum Preventative Maintenance Person-hours (per year)		2,970
9	Maximum Corrective Maintenance Person-hours (per year)		800
10	Confidence Limit		95%
11	Service Affecting Failures (per year)		15
12	Loss of Critical Function (Z)* (LCF) (per year)		1
13	Reduction in Operating Margin (Y)* (hours), per year		88

* Indicates that this value is used in the Performance-Based Monthly Support Fee calculation as provided for in Appendix B2.2.4 (Calculation of Performance-Based Monthly Support Fee Adjustments).

I2 Service Levels for Technical Support Services. As part of the Warranty Services described in Contract Specifications, Section 13 (Warranty and Spare Parts) and the Support Services described in Contract Specifications, Section 32 (Support Services), Contractor shall provide technical support for Issues with the CBTC System as reported by the SFMTA using the following procedures.

I2.1 Severity Levels. There are three possible Severity Levels for Issues. SFMTA will assign one of the following Severity Levels to each Issue when it reports the Issue to Contractor. If Contractor does not receive a Severity Level from SFMTA in the initial report, Contractor shall ask the Owner's Representative to assign a Severity Level at the next available opportunity.

I2.1.1 Urgent. The Issue is causing a Service Delay greater than 2 minutes. A Service Delay is the interruption in transit service in which a one or more vehicles are stopped for two or more minutes due to a CBTC System Issue, or there is degradation or loss of functionality to the System such that one or more trains proceed slowly and fall more than two minutes behind schedule.

I2.1.2 Priority. The Issue is affecting rail operations but is not causing a Service Delay. Important functionality described in the Contract Specifications or the Contractor's manuals is not available, or SFMTA staff cannot perform routine operations, or the System is operating in a degraded mode. The Issue is causing a significant business impact, which is increasing the workload of SFMTA operations or maintenance staff to continue transit operations.

I2.1.3 Routine. All other Issues reported by the SFMTA.

I2.2 Incident Reporting and Handling Process

I2.2.1 Reporting. SFMTA staff may report Issues to Contractor by telephone call, text or email to Contractor, or electronically using a Contractor-provided system.

I2.2.1.1 When reporting Issues by telephone or text, SFMTA staff will describe the Issue in detail and will provide the name and phone number of the SFMTA contact person responsible for addressing the Issue with Contractor.

I2.2.1.2 When reporting Issues by email, SFMTA staff will use Contractor's CBTC Issue Report Form.

I2.2.1.3 Contractor's electronic reporting system shall mirror the same fields and format as the Issue Report Form.

I2.2.2 Contractor Handling. Contractor shall use the information in the Issue Report Form to log the Issue and assign a Severity Level based on the information provided in SFMTA's report. If the SFMTA staff submitting the report indicates the Severity Level, Contractor must assign that Severity Level.

12.2.2.1 When it has received an Issue report by telephone call or text, Contractor shall immediately fill in the CBTC Issue Report Form and email the completed form to the SFMTA's Owner's Representative as acknowledgment of receipt within 10 minutes of the receipt of the text or the end of the telephone call.

12.2.2.2 Contractor shall acknowledge receipt of Issue reports made by email by a reply to the email made within one hour of receipt.

12.2.2.3 Issue reports made using Contractor's electronic reporting system shall be acknowledged immediately upon the SFMTA submitting the report. Contractor's electronic reporting system shall automatically issue an email receipt to SFMTA's Owner's Representative as acknowledgment.

12.2.3 Disputes Involving Severity Level. If Contractor disagrees with the SFMTA's Severity Level assessment, Contractor may request a reevaluation of the Severity Level. Requests for reevaluation shall be directed to the Owner's Representative. After Contractor resolves the Issue, the SFMTA will make a final evaluation as to the Issue's severity. So long as Contractor meets the response and Resolution Time requirements in Table 2 within the time limit associated with the final assessment, the Issue will not count towards the Unsatisfactory Issue Tally.

12.2.4 Issue Report Form. Contractor's Issue Report Form shall, at a minimum, collect the following information:

- a. A unique identifier for referencing the Issue
- b. A description of the Issue
- c. The time and date the Issue was observed
- d. The name and contact information of the person reporting the Issue
- e. The subsystem(s) and/or Equipment affected by the Issue
- f. The Severity Level
- g. A narrative justification of the Severity Level, to include a description of the impacts to service and operations.
- h. Steps taken by SFMTA to troubleshoot, mitigate or address the Issue.

12.3 Issue Response and Resolution

12.3.1 Calculation of Response and Resolution Times. All times in this section are calculated from the time Contractor acknowledges receipt of the Issue report, as marked on the Issue Report Form according to the handling instructions in Section 12.2.2 (Contractor Handling). If Contractor does not acknowledge receipt, the times will start using the maximum times described in Section 12.2.2.

12.3.2 Response. Contractor shall respond to Issue reports within the Target Response Time established in this Appendix I, Table 2, based on the Severity Level. A response will have occurred at the time of the commencement of work (inclusive of analysis, root cause determination, and development of a fix) coupled with a communication from the Contractor to SFMTA that work has begun.

I2.3.3 Root Cause Disposition. Contractor shall transmit a report meeting the requirements in Contract Specifications Section 30.2.3 (Root Cause Analysis) that describes the root cause of an Issue to the SFMTA within the Target Root Cause Disposition time established in this Appendix I, Table 2, based on the Severity Level.

I2.3.4 Resolution. Contractor shall resolve the issue within the Target Resolution Time established in Appendix I (Performance and Service Level Requirements), Table 2, based on the Severity Level. An Issue is resolved either when Contractor performs an action, such as a design modification, Software release, or recall of Equipment, that Contractor and SFMTA agree will address the Issue such that the Issue no longer will occur. Issues may also be resolved using a workaround or if they cannot be duplicated, as described in this Section. These actions only establish the end of the Resolution Time if SFMTA acknowledges the Issue has been resolved satisfactorily as described in I2.3.4.3 (Closure).

I2.3.4.1 Workarounds. An Urgent Issue where the Contractor has applied a workaround or stopgap solution which reduces its Severity Level may be resolved. A workaround is a procedure designed to avoid the conditions which cause the Issue, such that if the workaround procedure is followed, the Issue will not occur. To resolve the Urgent Issue, Contractor shall develop a written workaround procedure or operating restriction to SFMTA, fill out a new Issue Report Form logged at the new Severity Level and transmit the workaround procedure or operating restriction and the new Issue Report Form to the Owner's Representative. Issues with a Severity Level of "Priority" or "Routine" may not be resolved using a workaround.

I2.3.4.1.1 Failure to Follow Workaround. If the Contractor has resolved an Urgent Issue using a workaround or operating restriction, and the Urgent Issue reoccurs because SFMTA did not follow the workaround procedure or operating restriction, the resulting Malfunction or failure shall not be considered a new Issue and shall not be chargeable under the FRACAS process described in Contract Specifications Section 30 (RAM).

I2.3.4.2 No Fault Found. Issues which cannot be duplicated, or for which Contractor cannot find determine a cause may be deemed resolved, unless SFMTA can show Contractor that the Issue still exists. Issues resolved in this way shall be distinguished from other resolved Issues so that they may be reopened if the Issue recurs.

I2.3.4.3 Closure. Upon SFMTA's acknowledgment that the Issue has been resolved satisfactorily, the issue may be closed, which removes it from the Unsatisfactory Issues Tally, if applicable.

Table 2: Response and Resolution Times

Performance Metric	Calculation	Target
Response Time	Maximum number of minutes between a trouble call and the initiation of troubleshooting or repair work <i>per incident</i> before affecting Monthly Support Fee	Example: 5 min
Urgent: An Issue with the train control System is causing a Service Delay.		15 mins
Priority: An Issue with the train control System is affecting rail operations.		15 mins
Routine: Any other Issue		60 mins via helpdesk, 1 business day via email.
Root Cause Disposition Time	Maximum number of hours <i>per incident</i> between the initiation of troubleshooting and a report sent to the SFMTA detailing a root cause, before affecting Monthly Support Fee	Example: 1 hour
Urgent: An Issue with the train control System is causing a Service Delay.		1 hour* (see note in Assumptions)
Priority: An Issue with the train control System is affecting rail operations.		7 days
Routine: Any other Issue		60 days
Resolution Time	Maximum number of hours <i>per incident</i> that tickets are open before affecting Monthly Support Fee	Example: 1 hour
Urgent: An Issue with the train control System is causing a Service Delay.		2 hours* (see note in Assumptions)
Priority: An Issue with the train control System is affecting rail operations.		90 days
Routine: Any other Issue		180 days

12.4 Calculation of Unsatisfactory Issues Tally. The number of issues which are not resolved satisfactorily (“Unsatisfactory Issues”) each month affects the Performance-Based Monthly Support Fee calculation, as provided for in Appendix B2.2.4 (Calculation of Performance-Based Monthly Support Fee Adjustments). This section provides the procedures for calculating this tally.

12.4.1 Unsatisfactory Issue Designation and Scoring. An Issue is designated as an Unsatisfactory Issue if the Response Time, Root Cause Disposition time, or

Resolution Time exceeded the Targets established in Appendix I, Table 2. An Unsatisfactory Issue can have a score of 1, 2, or 3 depending on whether one, two or all three of these targets have been exceeded.

I2.4.2 Monthly Tally. Each month, the Unsatisfactory Issues are tallied by summing the score for each Unsatisfactory Issue as provided for in I2.4.1 (Unsatisfactory Issue Designation and Scoring) above. Each Unsatisfactory Issue can add 1, 2, or 3 to the tally. All Unsatisfactory Issues are tallied each month, starting with the month they are first designated Unsatisfactory, until they are closed. Each month, SFMTA will compare this Unsatisfactory Issues Tally to the values in Appendix B2 (Calculation of Charges), Table 6 when calculating the Contractor’s Monthly Support Fee.

I3 Software Release Schedule. During the Support Term of this Agreement and as part of the included Support Services, the Contractor shall provide Software Releases meeting the requirements in Contract Specifications, Section 32.4.9 (Regular Software Releases) at the regular frequency specified in this Appendix I. Table 3.

Table 3: Software Release Schedule (Descriptions of the subsystem are specified in these sections of the Contract Specifications)		
Proposer may add additional lines to this Table e if necessary to describe its intended software update schedule.		
Frequency (e.g., every 5 years, annually, quarterly, semi-annually)	ATS (Section 17)	Every 3-5 years
	ATO/ATP (Sections 18 and 19) Central Equipment	Every 3-5 years
	Wireless Network (Section 26.4)	1-2 years
	NMS (Section 20.3)	1-2 years
	NSS (Section 6.5)	Every 3-5 years
	Zone/Object Controllers (Section 27.8.1)	5 years
	Interlockings (Section 27.8.2)	5 years
	Onboard Equipment (Section 24)	5 years
	Workstations (Section 27.7.3)	Annually
	CMMS (Section 20.2)	5 years

Appendix J

SFMTA Policies and Procedures

The attached documents in this Appendix J are the current versions (at time this Agreement was signed) of SFMTA Policies and Procedures applicable to the Work. From time to time the SFMTA may update these Policies and Procedures. The SFMTA Project Manager will communicate changes to these attached Policies and Procedures in writing, and in that communication provide replacement policy and procedure documents. When provided, those replacement documents will supersede the original documents in this Appendix J.

Appendix J includes the following documents:

- (1) SFMTA Track and Tunnel Access Procedures
- (2) Barcoding Procedures
- (3) Technology Change Control Policy and Procedures
- (4) System Safety Rail Change Control Board Policy
- (5) SFMTA Rail Rule Book
- (6) Train Control System Upload Template
- (7) SFMTA Technology Project Requirements
- (8) Construction Regulations Blue Book

These Policies and Procedures are voluminous and will be separately provided to the Contractor.

Appendix K

CBTC Software License Agreement

Hitachi Rail GTS USA Inc.

SFMTA CONTRACT SFMTA-2022-40 FTA

Note to Proposers: The structure and specific provisions of this Software License Agreement will necessarily be determined by the nature of the Software, Applications, and operating system of the selected Proposer's CBTC System. This Sample Software License Agreement sets out the governing principles that will determine the final terms and conditions of the negotiated Software License Agreement. If a Proposal includes Software as a Service as part of its CBTC System, a separate Software as a Service Agreement will be negotiated consistent with the governing principles set out in this Sample Software License Agreement.

ARTICLE 1 Purpose of Software License Agreement

This Software License Agreement (Software License) is subordinate to and is incorporated into SFMTA Contract SFMTA-2022-40 FTA ("Agreement). The terms and conditions of the Agreement apply to the Contractor's provision and management of all software components of the CBTC System, regardless of the physical location of the software product. This Software License sets out additional terms and conditions applicable to the Software that Contractor will provide to the SFMTA under the Agreement.

ARTICLE 2 Definitions

The following definitions and the definitions of terms provided in the General Provisions and the terms defined in the Contract Specifications apply to this Software License.

2.1. "Authorized Users" means a person authorized by City to access the City's Application, including any City employee, contractor, or agent, or any other individual or entity authorized by City.

2.2. "Disabling Code" means computer instructions or programs, subroutines, code, instructions, data or functions (including but not limited to viruses, worms, date bombs or time bombs), including but not limited to other programs, data storage, computer libraries and programs that self-replicate without manual intervention, instructions programmed to activate at a predetermined time or upon a specified event, and/or programs purporting to do a meaningful function but designed for a different function, that alter, destroy, inhibit, damage, interrupt, interfere with or hinder the operation of the City's access to the Application System Services through Contractor's Website and/or Authorized User's processing environment, the system in which it resides, or any other software or data on such system or any other system with which it is capable of communicating.

2.3. "Software" means all or one or more of the proprietary computer software programs necessary to operate, manage, test, train, analyze, report, or perform any other function

of the CBTC System described in the Agreement. The Software comprises Contractor software programs and third-party software programs and subprograms identified in Appendix A, all related materials, Documentation, all corrections, patches or updates thereto, and other written information received by City from Contractor under the Agreement, whether in machine-readable, embedded in Equipment, Server-Based, Hosted, or printed form.

2.4. “Software Acceptance” means notice from the City to Contractor that the Software meets the specifications and requirements of the Agreement.

2.5. “Software Acceptance Period” means the period allocated by City to test the Application to determine whether it conforms to the applicable Contract requirements and, if appropriate, properly operates in the defined operating environment, is capable of running on a repetitive basis, and is otherwise in compliance with the service level obligations without failure, which shall occur as part of the System Reliability, Availability, and Maintenance (RAM) performance testing. See Contract Specifications Sections 31, 30, and 13 for requirements concerning Software Acceptance testing, RAM, and Warranty Periods.

2.6. “Software Documentation” means technical publications provided by Contractor to City relating to use of the Software, including but not limited to reference, administrative, maintenance, and programmer manuals.

2.7. “Software License” means this contract document and any attached appendices, and all applicable City Ordinances and Mandatory City Requirements which are specifically incorporated into this Software License by reference as provided herein.

2.8. “Software Support Services” means the Services Contractor shall provide the SFMTA as Support Services, as described in Section 32 of the Contract Specifications.

2.9. “Source Code” means the human readable compliant form of the Software.

2.10. “Subsequent Release” means a release of the Software for use in a particular operating environment which supersedes, replaces, and/or improves the Software installed in that environment. A Subsequent Release is offered and expressly designated by Contractor as a replacement to a specified Software product. A Subsequent Release will be supported by Contractor in accordance with the terms of the Agreement.

ARTICLE 3 Software License

3.1. Grant of License. Subject to the terms and conditions of this Agreement, Contractor grants to City a non-exclusive and non-transferable, perpetual, unlimited enterprise license to use the Software. City acknowledges and agrees that the Software is the proprietary information of Contractor and that this Agreement grants City no title or right of ownership in the Software.

3.1.1. Restrictions on Use. City is authorized to use the Software only for City’s municipal purposes. City agrees that it will, through its best efforts, not use or permit the Software to be used in any manner, whether directly or indirectly, that would enable any other person or entity not authorized by this Agreement, to use the Software.

3.1.2. Disaster Recovery Copy. For the purpose of any bona fide City disaster recovery plan or with respect to the use of computer software in its municipal operations, City may make one copy of the Software for archival purposes and use such archival copy to restore use of the Software on a site owned or controlled by City. The use of such archival copy shall be limited to (1) the purpose of conducting limited testing of the disaster recovery plan's procedures and effectiveness and (2) during any period subsequent to the occurrence of an actual disaster during which the City cannot operate the Software on the existing site.

3.1.3. Transfer of Products. City may move the Software and supporting materials to another City site.

3.1.4. Documentation. Contractor shall provide City with the Software specified in this Agreement, and an electronic copy of the Software Documentation per installation. Contractor grants to City permission to duplicate all printed Software Documentation for City's municipal use.

3.2. Authorized Modification. Contractor shall cooperate with City to develop, use and modify Application Program Interfaces (APIs), macros and user interfaces. For purposes of this Agreement, such development shall be deemed an authorized modification. Contractor shall make no claim under this Agreement to ownership of any APIs, macros or other interfaces developed by or at the direction of the City. Contractor has no general objection to the City's use of third-party programs in conjunction with the Software licensed under this Agreement. Contractor recognizes that City has and will license third party programs that City will use with Contractor's products. Based on information provided to Contractor as to the Effective Date, Contractor agrees that such use does not constitute an unauthorized modification or violate the licenses granted under this Agreement.

3.3. Delivery and Installation of Software. Contractor shall deliver and install the Software as specified in the Contract Specifications.

3.4. Acceptance Testing. See Contract Specifications.

3.5. Nondisclosure. City agrees that it shall treat the Software as Contractor's Confidential Information and proprietary information in accordance with Section 13.1 of the General Provisions.

3.6. Discontinuance of Support. In addition to other Contractor obligations and City remedies provided in the Agreement or under law, Contractor agrees that in the event it discontinues its obligations under the terms of this Agreement, except as expressly provided for in Article 10 ("Termination and Default"), or ceases to market and/or provide maintenance and Support Services for the Software, and there is no successor in interest by merger, operation of law, assignment, purchase, or otherwise, it will provide City, without charge, one (1) copy of the then-current Source Code for all of the programs and all supporting Software Documentation for the Software then operating and installed at City's locations. If City should obtain the Source Code and the Software Documentation pursuant to this section, the only use made of the Source

Code and the Software Documentation will be for the proper maintenance of the Software in connection with City’s use of the Software as provided for, and limited by, the provisions of this Agreement.

ARTICLE 4 Term of the Software License

4.1. Term. The term of this Software License will commence on the Effective Date of the Agreement. The term of the Software License is perpetual and shall survive the termination or expiration of the CBTC Agreement.

ARTICLE 5 Terms and Conditions

5.1. Terms and Conditions of the Agreement Incorporated by Reference. This Software License is appended to the Agreement and is incorporated by reference into the Agreement. The terms and conditions stated in the Agreement apply to this Software License.

5.2. Software License and Services Fees. Contractor’s Software License and Services Fees are incorporated into the progressive compensation provided for Milestones completion, work progression payments, and Support Fees set out in Appendix B to the Agreement. The SFMTA will not compensate Contractor separately for the Software License or Software Services.

5.3. Control of Data and System. The SFMTA shall at all times have full control of the CBTC System’s operations and data. The SFMTA shall at all times have full control over access to the System and System Data. SFMTA shall determine who are Authorized Users and their respective levels of access. Contractor shall not utilize any Disabling Code or other System features that would allow Contractor to disable or in any way interfere with the SFMTA’s operation of the System, access to the System of any part of the System, or access to System Data. All Software and Applications used in the System or to support the System or in any part of the Services shall at all times be under SFMTA control, irrespective of whether the Software or Applications are installed on servers on SFMTA property, remote servers, or servers that operate over the internet (i.e., Cloud-based applications).

5.4. Copyright and Patent Infringement. Contractor shall fully indemnify and defend any claim or legal action alleging that the System or any part of the System or the SFMTA’s use of the System is unlawful, unauthorized, unlicensed, or infringes on any copyright or patent, without restriction or limitation of any kind. See General Provisions, Article 6.

5.5. Proprietary Markings. City agrees not to remove or destroy any proprietary markings or proprietary legends placed upon or contained within the Software or any related materials or Documentation.

5.6. Services Contractor Agrees to Perform. Contractor’s Services, including Support Services, are described in the General Provisions, and Appendix A to the Agreement (“Contract Specifications”).

5.7. Security. Contractor shall ensure that all electronic transmission or exchange of City Data will be encrypted using current industry standards. Contractor shall also ensure that all data exchanged shall be used expressly and solely for the purposes stated in the Agreement. City Data shall not be distributed, repurposed, or shared across other applications, environments, or business units of Contractor not involved in administration of this Agreement, unless otherwise permitted in this Agreement. Remote access to view City data by Contractor for development

and technical support purposes from outside the United States is allowed as long as City Data remains hosted solely on systems residing in the continental United States.

5.7.1. Document Delivery. Contractor will deliver completed Software Documentation in electronic format for the Software as part of the System Final Design Review package as described in Section 4.2.3. The Software Documentation will describe the functions and features of the Software, including all subsequent revisions thereto. The Software Documentation shall be understandable by a typical end user and shall provide Authorized Users with sufficient instruction such that an Authorized User can become self-reliant with respect to access and use of the Software. City shall have the right to make any number of additional copies of the Software Documentation at no additional charge.

5.8. Contractor Warranties.

5.8.1. Warranty of Performance. Contractor warrants that when the Software specified in the Agreement and all updates and improvements to the Software are delivered to City, they will be free from defects as to design, material, and workmanship and will perform in accordance with the Contract Specifications.

5.8.2. Compliance with Description of Services. Contractor represents and warrants that the Software all Updates and Upgrades will comply in all material respects with the Contract Specifications.

5.8.3. Title. Contractor represents and warrants to City that it is the lawful owner or license holder of all Software, materials and property identified by Contractor as Contractor-owned and used by it in the performance of the Services contemplated hereunder and the Contractor has the right to issue this Software License to permit City to use Software, the System, and each component thereof. To the extent that Contractor has used Open Source Software (“OSS”) in the development of the Software, the CBTC System, and the Services, Contractor represents and warrants that it complies with any applicable OSS license(s), it has sufficient licensed rights to use and relicense to the City any included code in the Software, and Contractor is not infringing on any third party’s patent or copyright in its use and licensing the Software to the City.

5.8.4. Disabling Code. Contractor represents and warrants that the Software on and Services, and any information, reports or other materials provided to City as a result of the operation of the System, including future Upgrades, Updates and other enhancements and modifications of the Software and the System shall be free of any Disabling Code.

5.8.5. Warranty of Suitability for Intended Purpose. Contractor warrants that the Software and Services will be suitable for the intended purpose of the Agreement.

5.9. Accessibility Requirements - Compliance with Americans with Disabilities Act.

5.9.1. Contractor shall ensure and warrants that all products and services consisting of or utilizing electronic, information or communication technology (EICT), including but not limited to software and web-based applications, meet the applicable requirements of each of the following statutes, regulations, standards, guidelines and policies (“Requirements”):

(a) California Government Code (Cal. Gov. Code) Section 11135, which prohibits discrimination on the basis of physical or mental disability and other grounds;

(b) Section 202 of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. 12132, et seq.), and the federal rules and regulations adopted in implementation thereof, which are incorporated in California law by Cal. Gov. Code Section 11135;

(c) Cal. Gov. Code Section 7405, which:

(i) Incorporates in California law Section 508 of the Rehabilitation Act of 1973, as amended [29 United States Code (USC) Sec. 794d], and implementing regulations, as set forth in 36 Code of Federal Regulations (CFR) Part 1194, as in effect on March 19, 2017; and

(ii) Requires Contractors with state governmental entities subject to Cal. Gov. Code Section 11135 to respond to and resolve complaints regarding accessibility of its EICT products and related services;

(d) To the extent any telecommunications products or services are provided under the contract, 47 USC Section 255 and related regulations, including:

(i) 47 CFR Parts 6, 7, 14 and (if real-time text functionality is provided) 67, and

(ii) 36 CFR Part 1193, to the extent it remains in effect;

5.9.1.2 California Fair Employment and Housing Act (Cal. Gov. Code sections 12900-12951 & 12960-12976);

(e) Unruh Civil Rights Act (California Civil Code section 51);

(f) Disabled Persons Act (California Civil Code sections 54-54.1);

(g) Cal. Gov. Code sections 19230-19237;

(h) Web Content Accessibility Guidelines (WCAG) 2.0 Levels A and AA; and

(i) WCAG 1.0 Level AA, to the extent these guidelines include additional requirements that are not included in and are not inconsistent with WCAG 2.0 Levels A and AA and WCAG 2.1, as updated from time to time.

5.9.2. Contractor shall ensure that its products and services maintain or enhance, and do not diminish, the net accessibility, usability and compatibility of the City's existing environment and applications.

5.9.3. All documentation, user guides, training materials and services, and challenge response password and other identity-verification systems must meet the requirements. Contractor shall ensure that individuals with disabilities have access to the full functionality and Software Documentation for the product, including instructions, product information (including information accessible features), and technical support which is provided to equivalently authorized individuals without disabilities.

5.9.4. All subsequent updates, upgrades, bug-fixes and patches provided pursuant to the contract shall meet the Requirements.

5.9.5. In accordance with Cal. Gov. Code section 7405(b), Contractor shall have an ongoing obligation to promptly respond to and resolve any complaint regarding accessibility

of its EICT products and services that is brought to the attention of Contractor, to the satisfaction of the City.

5.9.6. A failure to meet any of the requirements may result in rejection of the product or services by the City, withholding of payment, a complaint filed with California Department of Fair Employment and Housing (DFEH), a civil action, or other remedies, including, but not limited to, those provided in Cal. Gov. Code sections 11136 – 11139 and 12930, and this Agreement.

5.9.7. In the event of a conflict between accessibility standards, the highest standard will apply.

5.10. American Institute of Certified Public Accounts (AICPA) Audit Reports.

5.10.1. Contractor shall provide to City, on an annual basis, an SSAE 18, SOC 2, Type 2 Report, and an SSAE 18, SOC 1, Type 2 Audit Report, to be conducted by an independent third party (“Audit Reports”) (if Contractor is using a hosting service provider, Contractor shall provide such Audit Reports it receives from its service provider or providers) as follows: (a) the Audit Reports shall include a 365 day (12-month) testing period; and (b) the Audit Reports shall be available to City no later than thirty (30) days after they are received by Contractor. If Contractor receives a so-called “negative assurance opinion,” or the annual Audit Report finds a material data privacy or information security issue, Contractor shall notify City of such opinion within three (3) days of receipt by Contractor. Contractor shall implement reasonably required safeguards as identified by any audit of Contractor’s data privacy and information security program or promptly notify City in writing if Contractor is unable to implement mitigation measures to address the issue(s). Upon any such notification, City shall have the right, without further obligation or liability to Contractor, to terminate this Agreement. Any failure by Contractor to comply with this Section shall be a material breach of this Agreement.

5.10.2. Audit of Contractor’s Policies. Contractor agrees to make its policies, procedures and practices regarding Data Security available to City, if needed, and agrees that City reserves the rights, including, but not limited to, making a site visit, scanning for malicious codes, and hiring a third-party to perform a security audit if City determines that the Audit Report is unsatisfactory.

5.10.3. Information Security Audits. Contractor must contract with an independent third party to perform yearly information security audits of their primary and backup Data Centers. The annual audits must include an outside penetration/vulnerability test, and internal penetration and vulnerability tests with the third-party directly on the internal network. The summary results of the audits must be shared with the City. All audit findings must be remedied.

5.10.4. Audit Findings. Contractor shall implement reasonably required safeguards as identified by City or by any audit of Contractor’s data privacy and information security program.

Appendix L

Reference Materials

Appendix L will be provided as a separate file.



SFMTA

Train Control Upgrade Project

Budget and Finance Committee
November 13, 2024

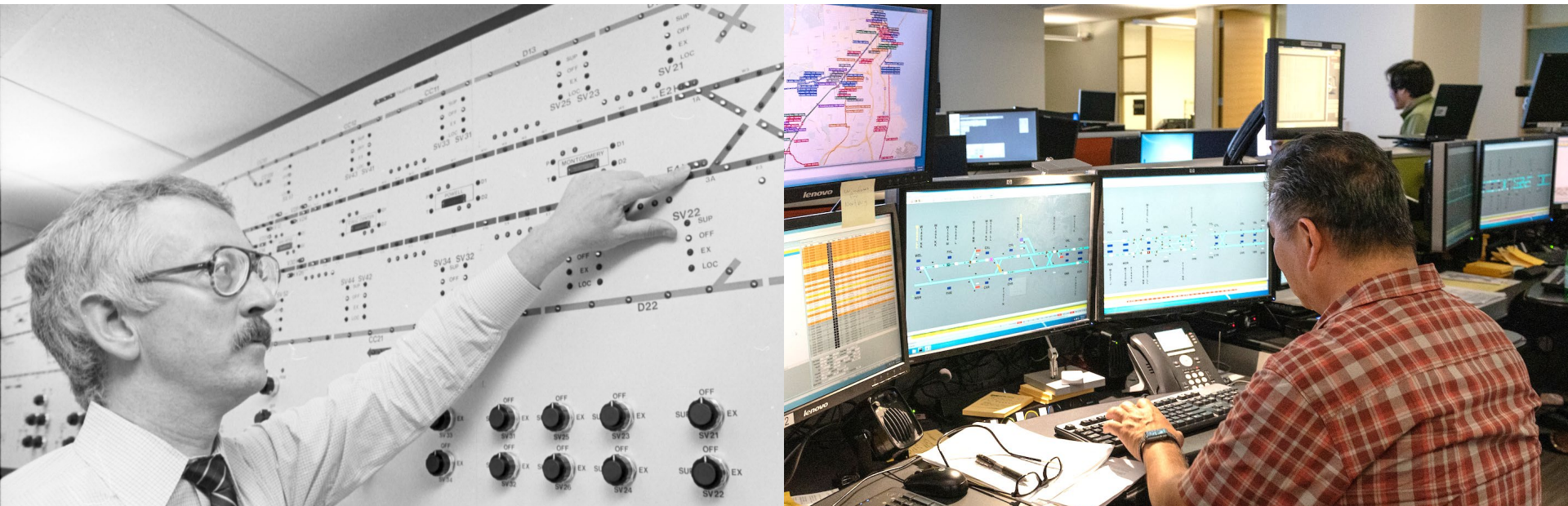




Train Control Upgrade Project

San Francisco's most significant Muni Metro investment in a generation.

This project will replace the technology that makes Muni Metro work and make a quantum leap forward in fast, frequent, reliable Metro service and transit connections citywide for decades to come.





Learning from past projects and improving contracting approach

Separate contracts

CONSULTANT

- Support staff with project delivery

SBE/DBE goal: 15%

Contract approved August 2024

SUPPLIER

- Provides technology
- Helps design system
- Must ensure technology meets performance requirements
- Provides long-term maintenance support and knowledge transfer to SFMTA staff

SBE/DBE goal: 5%

INSTALLERS

- Multiple installers shorten construction timeline

SBE/DBE goal: 100% (preliminary)

Future RFQ followed by individual bids

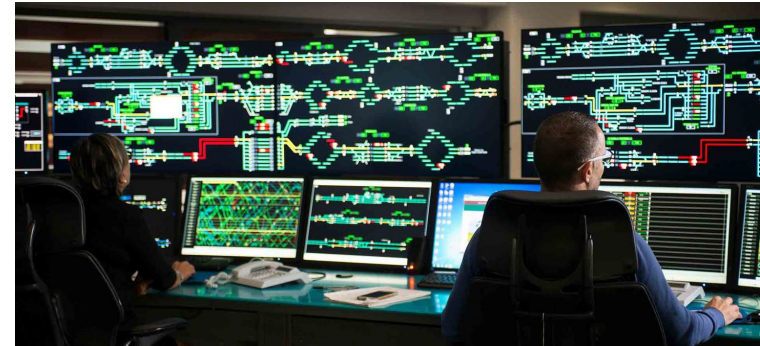


Supplier: Hitachi Rail GTS USA



Benefits:

- Hitachi has the most advanced technology of the bids received
- Only Hitachi offers transponder-based train control communication technology on street and in subway
- Hitachi can reuse existing computers on LRV4s, reducing vehicle integration cost and risk
- Hitachi's wayside equipment is smaller and can be centrally located, reducing clutter on the street and making maintenance easier
- SFMTA is familiar with this supplier and has structured contract to apply lessons learned





Better outcomes from competitive, negotiated procurement

Contract wins for the SFMTA

Negotiated procurement process allowed for discussion with industry. Vendors understood project needs better. Lead to better proposals.

Annual software updates

- Keeps the new train control system up to date.

Long-term support included in contract

- Recognizes that a new train control system is a 30-year investment. Includes all future spare parts.

Performance goals based on outcomes

- Builds performance into contract. Incentivizes supplier to build quality into the design up front and encourages supplier to invest support resources to ensure the new train control system works properly.

Knowledge transfer

- Creates a pathway to build in-house expertise for greater self-sufficiency.



Supplier Deliverables



Design: Hitachi will customize their baseline latest-generation train control technology to SFMTA's specifications



Installation: Hitachi delivers new train control components and monitors installation



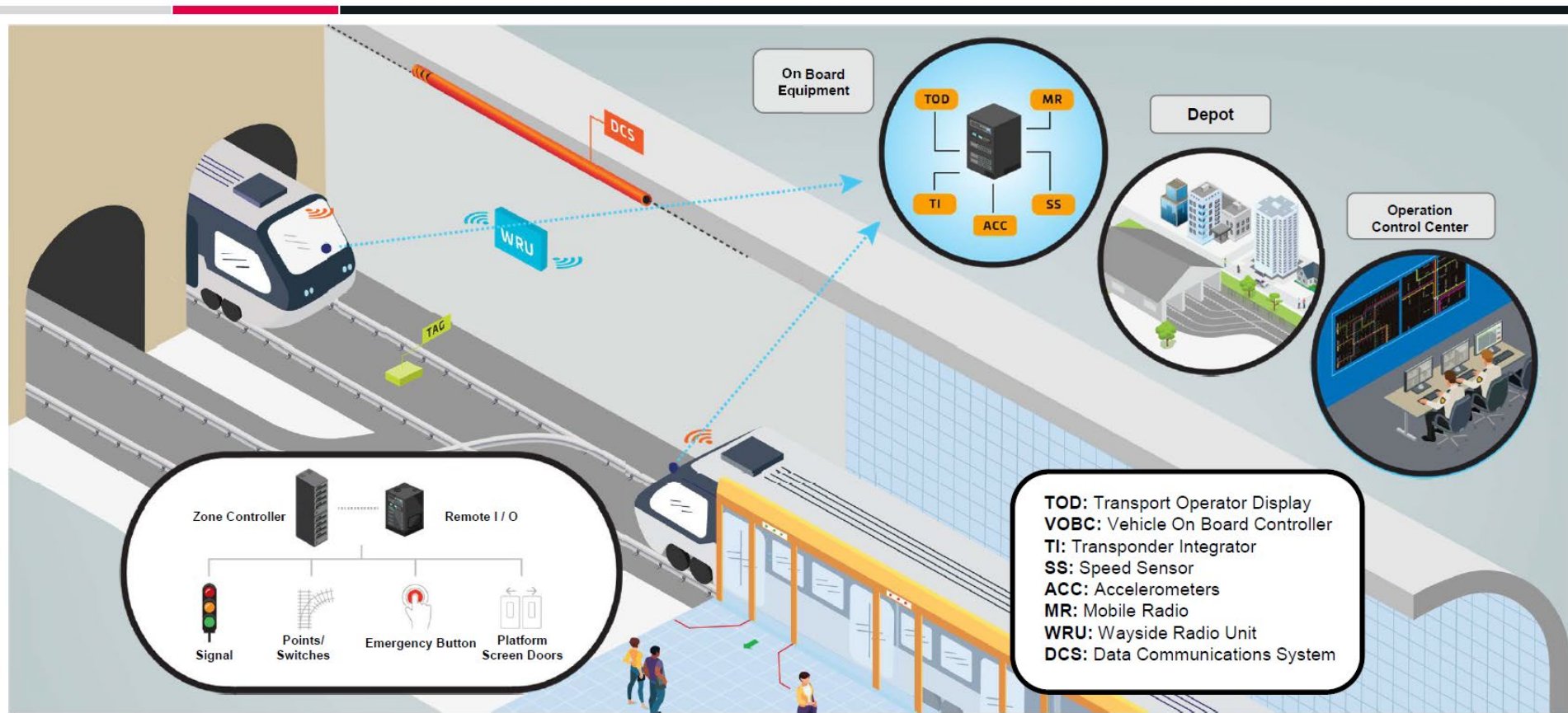
Testing: Hitachi performs testing to ensure the system meets performance requirements



Long-term support: Hitachi provides maintenance support, training to SFMTA staff, and continues to monitor performance

Train Control Components

Train Control System - SelTrac™





Long-term Support

Design-Furnish-Support contract with up to 20 years of on-site technical support and performance-based requirements.

29-year contract

Procurement:
9 years

**Base Support:
10 years**

**Two 5-year
Support Options**

- Train SFMTA staff to use and upkeep system
- Help SFMTA staff troubleshooting issues
- Includes unlimited spare parts as needed to maintain the train control system
- Includes automatic annual software updates



Transparent, full scope investment

TCUP is the first project to plan for and build in support costs up front.

The Not-To-Exceed amounts presented below assume 6% escalation per year (contract maximum) but contract costs would be adjusted based on actual inflation.

Train Control Supplier Contract – Not-to-Exceed Amounts

Total Procurement including Options (TCUP Capital Budget)	\$212,093,633
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**This project cost is already funded in the TCUP \$700M funding plan, through capital funds than cannot be used to fund Muni service.*

Total Initial Support (FY32-44 Operating Budget)	\$114,070,833
---	----------------------

**We know we will need continual support and some of this cost absorbs what we already pay in support for the current system.*

Total Support Options (FY45-54 Operating Budget)	\$237,681,185
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**Structuring as options give SFMTA flexibility to revisit support based on needs in ten years.*







TCUP Capital Budget

Item	Budget
Train Control Supplier Contract (This Contract)	\$212M
Consultant Contract (Approved Aug 2024)	\$30M
Installation Contracts	\$99M
Project Management and Engineering	\$102M
Network Infrastructure and Systems Integration	\$64M
Testing, Training and Operational Support	\$53M
Contingency (~25%)	\$140M
Total Train Control Capital Budget	\$700M



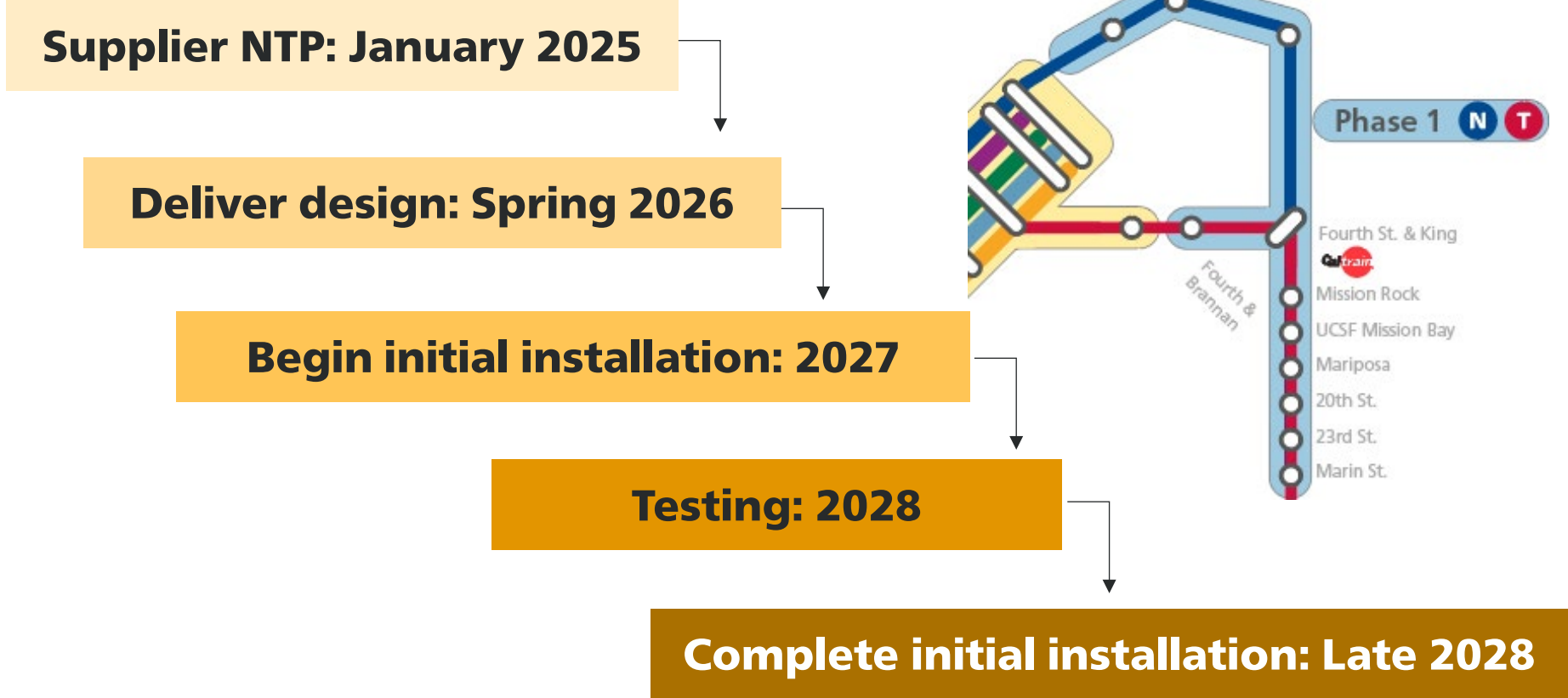
Project Funding Plan

Total Project Budget	\$700,000,000
2021 Revenue Bond	\$24,500,000
Prop B (General Fund)	\$30,000,000
TSF Developer Fee	\$12,000,000
Prop L	\$16,000,000
GO Bond	\$30,000,000
AB 664	\$1,500,000
TIRCP Grant	\$130,000,000
SB 1 (State of Good Repair)	\$25,000,000
FTA (Transit Capital Priorities)	\$375,000,000
Funding Need	\$56,000,000

	Local
	Regional
	State
	Federal

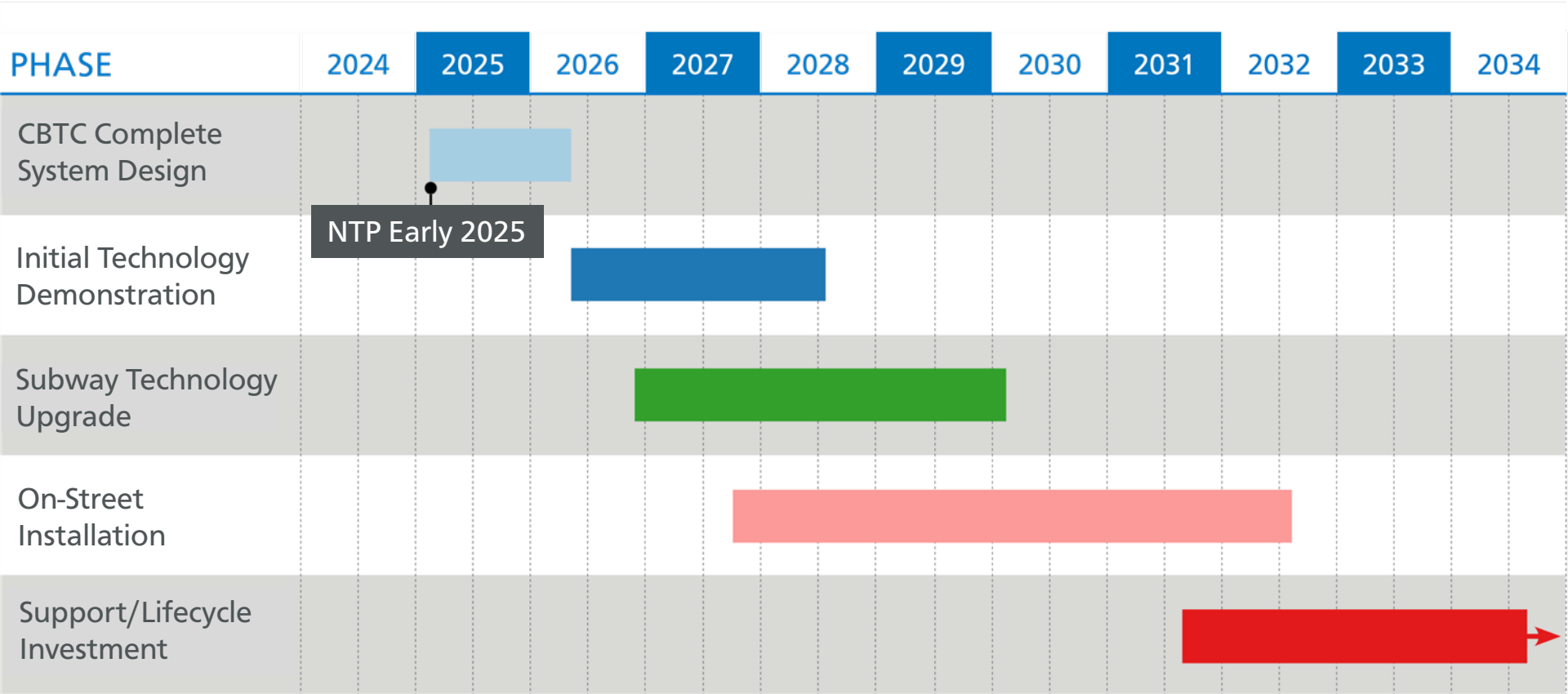


Roadmap from Notice to Proceed to initial installation

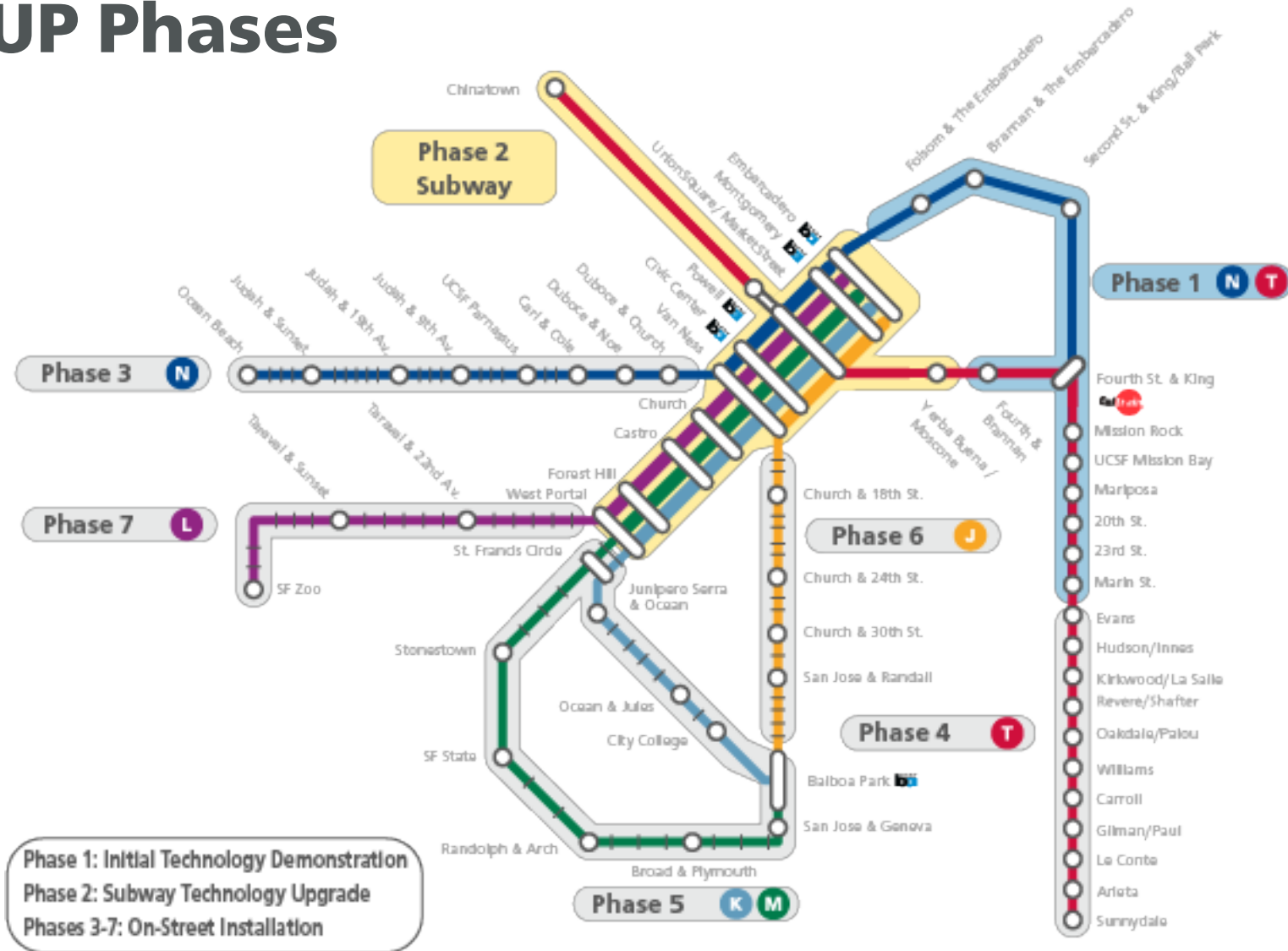




Train Control Upgrade Project Timeline



TCUP Phases





Staff recommendation

Staff recommends that the Board of Supervisors authorize the SFMTA to execute Contract No. SFMTA-2022-40 FTA with Hitachi Rail GTS USA for design, furnishment, system implementation, support and related services for a Communications-Based Train Control System (CBTC), for a contract term of 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years.

Questions?



PERSONAL SERVICES CONTRACT SUMMARY ("PSC FORM 1")

Department: MUNICIPAL TRANSPORTATION AGENCY -- MTA Dept. Code: MTA

Type of Request: [X] Initial [] Modification of an existing PSC (PSC # _____)

Type of Approval: [] Expedited [X] Regular ([] Omit Posting)

Type of Service: Train control system design and procurement

Funding Source: Federal/General/Sales Tax/Operating Funds PSC Duration: 28 years 1 week
PSC Amount: \$351,000,000 PSC Est. Start Date: 01/16/2025 PSC Est. End Date: 01/16/2053

1. Description of Work

A. Scope of Work:

The Train Control Upgrade Project (TCUP) is a capital project that will procure a new Communications Based Train Control (CBTC) system to replace the aging train control signal system currently installed in the Market Street Subway and expand CBTC to the surface. It will provide operations and service planning staff with the tools necessary to deliver reliable, speedy, high-frequency rail transit to, from, and within downtown San Francisco. When installed, the new CBTC system will cover the entire Muni Metro railway. This system will also require long-term support from the supplier in order to meet SFMTA's requirements and ensure safety, reliability, availability, and maintainability at all times.

The CBTC system needs to be designed and engineered to meet SFMTA's requirements and ensure safety, reliability, availability, and maintainability. After preliminary design, train control components will be installed along the Muni Metro trackway and fitted to the LRV4 light rail vehicles in a geographically phased approach. Each phase will feature detailed design and construction, with project completion expected in FY35.

This contract includes design and engineering services necessary to develop a CBTC system, new and

B. Explain why this service is necessary and the consequence of denial:

The current Automatic Train Control System (ATCS) in the Market Street Subway has exceeded its useful life and needs replacement. SFMTA spends \$2 million annually to maintain the existing system, and yet it remains unreliable. Component failures are persistent, and frequently lead to congestion in the subway and delays for Muni Metro service. Additionally, the system is becoming increasingly difficult to maintain due to obsolescence. Certain components of the system were declared obsolete by the manufacturer in 2018 and spare components are increasingly unavailable or too costly to replace.

Denying this service would result in SFMTA continuing to use the current train control system. SFMTA

C. Has this service been provided in the past. If so, how? If the service was provided via a PSC, provide the most recently approved PSC # and upload a copy of the PSC.

The existing train control system was originally procured from a third-party train control vendor, Thales, who provided design and engineering services for the system. They are also the sole source for spare equipment.

Please see attached SFMTA Board Resolution No. 09-062 / SFMTA Contract No. 1226 and approved PSC # 44370 18/19

D. Will the contract(s) be renewed? No, The contract agreement will have a base term of 18 years, which may

2. Union Notification: On 05/16/2024, the Department notified the following employee organizations of this PSC/RFP request: all unions were notified

FOR DEPARTMENT OF HUMAN RESOURCES USE

PSC# 44370 - 23/24

DHR Analysis/Recommendation:

07/15/2024

Commission Approval Required

DHR Approved for 07/15/2024

Approved by Civil Service Commission with conditions

3. Description of Required Skills/Expertise

A. Specify required skills and/or expertise:

The SFMTA will require expertise in designing train control systems as well as experience integrating this technology into existing active service railways. The train control system designer will have successfully provided CBTC to agencies of similar size and complexity as SFMTA. Train control systems are proprietary technology, and their design requires special knowledge of the system which is generally only obtainable through train control suppliers.

B. Which, if any, civil service class(es) normally perform(s) this work?
none,

C. Will contractor provide facilities and/or equipment not currently possessed by the City? If yes, explain:
Yes. The contractor will provide modern Communications Based Train Control (CBTC) equipment that the City does not currently possess. This equipment is specially manufactured and only available through third-party train control vendors.

4. Why Classified Civil Service Cannot Perform

A. Explain why civil service classes are not applicable:

Design, engineering, and long-term support for proprietary train control systems is a specialty service that the City does not have an applicable civil service class to provide. The system design and long-term technical support for the existing train control system has been provided by the original system supplier, so the City has not had a need to establish classifications to perform this work. Furthermore, designing and engineering a train control system is fulfilling a one-time capital program requirement, and is not an ongoing job duty that would require a

B. Would it be practical to adopt a new civil service class to perform this work? Explain.

No. Even if a new civil service class were to be established, there will not be an ongoing need to design and deliver train control systems within SFMTA. In addition to the lack of ongoing need, there is simply a lack of train control expertise in the United States; transit agencies must rely on one of a few large multinational corporations

5. Additional Information (if "yes", attach explanation)

YES NO

- A. Will the contractor directly supervise City and County employee? YES NO
- B. Will the contractor train City and County employee?
The contractor will prepare SFMTA staff to use, configure, and maintain the YES NO
- C. Are there legal mandates requiring the use of contractual services? YES NO
- D. Are there federal or state grant requirements regarding the use of contractual services? YES NO
- E. Has a board or commission determined that contracting is the most effective way to provide this service? YES NO
- F. Will the proposed work be completed by a contractor that has a current PSC contract with your department? YES NO

THE ABOVE INFORMATION IS SUBMITTED AS COMPLETE AND ACCURATE ON BEHALF OF THE DEPARTMENT HEAD ON 06/18/2024 BY:

Name: Simon Abulencia Phone: 415-646-2366 Email: simon.abulencia@sfmta.com

Address: 1 South Van Ness 6th Floor San Francisco, CA 94103



**CIVIL SERVICE COMMISSION
CITY AND COUNTY OF SAN FRANCISCO**

**LONDON N. BREED
MAYOR**

Sent via Electronic Mail

July 17, 2024

NOTICE OF CIVIL SERVICE COMMISSION ACTION

SUBJECT: REVIEW OF REQUEST FOR APPROVAL OF PROPOSED PERSONAL SERVICES CONTRACT 44999-23/24; 41477-23/24; 43877-23/24; 45475-23/24; 48145-23/24; 45106-23/24; 47885-23/24; 49509-23/24; 49838-23/24; 44370-23/24; 47881-18/19; 45745-23/24; 41452-21/22; 46341-22/23; 44782-20/21 AND 48427-17/18.

At its meeting on **July 15, 2024**, the Civil Service Commission had for its consideration the above matter.

The Civil Service Commission:

- 1) Approved PSC# 45106-23/24 from the Department of Public Works (DPW) on a one-time basis.
- 2) Approved PSC# 47885-23/24 from the Department of Public Health (DPH).
- 3) Approved PSC# 49509-23/24 from the Department of Public Health (DPH) with the condition to remove the extraneous of classifications; only classifications 2587 – Health Worker III, 2588 – Health Worker IV, 2910 – Social Worker, and 2930 – Behavioral Health Clinician apply. Report back to Executive Officer, Sandra Eng within one week with data on the number of people this Personal Service Contract will serve and how that number differs from the number of people served under PSC 48427-17/18.
- 4) Approved PSC# 49838-23/24 from the Department of Public Health (DPH).
- 5) Approved PSC# 48427-17/18 from the Department of Public Health (DPH).
- 6) **Approved PSC# 44370-23/24** from the Municipal Transportation Agency (MTA) with the condition of reporting back to the Commission in year three (3), in year four (4), and then every four (4) years thereafter. Report back on the progress of each component, identifies status of any work brought in-house, knowledge transfer and possible training of any staff not just Local 21 members, status and summary of discussions with applicable employee organizations; and any other pertinent factors including but not limited to changes in direction.
- 7) Adopted the report. Approved the remaining requests for proposed Personal Services Contract; Notify the office of the Controller and the office of Contract Administration.

If this matter is subject to Code of Civil Procedure (CCP) Section 1094.5, the time within which judicial review must be sought is set forth in CCP Section 1094.

NOTE: It is important that a copy of this action be kept in the department files as you will need it in the future as proof of Civil Service Commission approval. Please share it with everyone responsible for follow-up.

CIVIL SERVICE COMMISSION

LAVENA HOLMES
Deputy Direct

Attachment

Cc: Simon Abulencia, Municipal Transportation Agency
Reanna Albert, Department of Public Health
Cynthia Avakian, Airport Commission
Alexander Burns, Department of Public Works
Shawndrea Hale, Public Utilities Commission
Kelly Hiramoto, Department of Public Health
Lynn Khaw, Office of the City Administrator
Elissa Koestenbaum, Fire Department
Daniel Kwon, Public Utilities Commission
Joan Lubamersky, Office of the City Administrator
Amy Nuque, Municipal Transportation Agency
Commission File
Chron



CEQA Exemption Determination

PROPERTY INFORMATION/PROJECT DESCRIPTION

Project Address		Block/Lot(s)
SFMTA Train Control Upgrade Project		
Case No.		Permit No.
2022-000870ENV		
<input checked="" type="checkbox"/> Addition/ Alteration	<input type="checkbox"/> Demolition (requires HRE for Category B Building)	<input type="checkbox"/> New Construction
<p>Project description for Planning Department approval.</p> <p>The San Francisco Municipal Transportation Agency (SFMTA) currently uses an automatic train control system (ATCS) to operate the Market Street Subway and Central Subway. The Train Control Upgrade Project (TCUP or "proposed project") would replace the existing Muni Metro automatic train control system (ATCS) in the Market Street and Central subways with a new Communications Based Train Control (CBTC) system and expand modern CBTC train control benefits to the surface light rail portions of the Muni Metro system. Under CBTC, the Muni Metro system would be managed centrally under a single, modernized system, and would support existing transit service and allow for the increase of passenger or commuter service on the Muni Metro system's rail lines. The CBTC technology uses WiFi or cellular connections to precisely track and continually communicate with every light rail train in service. The project would require installation of the following components: fiber optic cables in existing conduit alongside the existing trackway, small transponder tags between the tracks, CBTC radio and wireless access equipment (small boxes) in the subway and on City-owned light standards, as well as Overhead Contact System (OCS) poles, and CBTC equipment in cabinets along the surface routes and in existing City-owned equipment rooms in the subway. The</p> <p>FULL PROJECT DESCRIPTION ATTACHED</p>		

EXEMPTION TYPE

The project has been determined to be exempt under the California Environmental Quality Act (CEQA).	
<input type="checkbox"/>	Class 1 - Existing Facilities. (CEQA Guidelines section 15301) Interior and exterior alterations; additions under 10,000 sq. ft.
<input type="checkbox"/>	Class 3 - New Construction. (CEQA Guidelines section 15303) Up to three new single-family residences or six dwelling units in one building; commercial/office structures; utility extensions; change of use under 10,000 sq. ft. if principally permitted or with a CU.
<input type="checkbox"/>	<p>Class 32 - In-Fill Development. (CEQA Guidelines section 15332) New Construction of seven or more units or additions greater than 10,000 sq. ft. and meets the conditions described below:</p> <p>(a) The project is consistent with the applicable general plan designation and all applicable general plan policies as well as with applicable zoning designation and regulations.</p> <p>(b) The proposed development occurs within city limits on a project site of no more than 5 acres substantially surrounded by urban uses.</p> <p>(c) The project site has no value as habitat for endangered rare or threatened species.</p> <p>(d) Approval of the project would not result in any significant effects relating to traffic, noise, air quality, or water quality.</p> <p>(e) The site can be adequately served by all required utilities and public services.</p>
<input checked="" type="checkbox"/>	Other _____ Statutory Exemption per Public Resources Code Sections 21080(b)(10) and 21080(b)(11) (Specified Mass Transit Projects), and CEQA Guidelines section 15275(a).
<input type="checkbox"/>	Common Sense Exemption (CEQA Guidelines section 15061(b)(3)). It can be seen with certainty that there is no possibility of a significant effect on the environment.

ENVIRONMENTAL SCREENING ASSESSMENT

Comments:

Per Public Resources Code sections 21080(b)(10) and 21080(b)(11) (Specified Mass Transit Projects) and CEQA Guidelines section 15275(a), CEQA does not apply to mass transit projects that institute or increase passenger or commuter service on rail lines already in use, including the modernization of existing stations.

This project is statutorily exempt, therefore none of the categorical exemption checkboxes in this exemption checklist apply.

Planner Signature: Jennifer M Barbour Mckellar

PROPERTY STATUS - HISTORIC RESOURCE

PROPERTY IS ONE OF THE FOLLOWING:

<input type="checkbox"/>	Category A: Known Historical Resource.
<input type="checkbox"/>	Category B: Potential Historical Resource (over 45 years of age).
<input checked="" type="checkbox"/>	Category C: Not a Historical Resource or Not Age Eligible (under 45 years of age).

PROPOSED WORK CHECKLIST

Check all that apply to the project.

<input type="checkbox"/>	Change of use and new construction. Tenant improvements not included.
<input type="checkbox"/>	Regular maintenance or repair to correct or repair deterioration, decay, or damage to building.
<input type="checkbox"/>	Window replacement that meets the Department's <i>Window Replacement Standards</i> .
<input type="checkbox"/>	Garage work. A new opening that meets the <i>Guidelines for Adding Garages and Curb Cuts</i> , or replacement of a garage door in an existing opening that meets the Residential Design Guidelines.
<input type="checkbox"/>	Deck, terrace construction, or fences not visible from any immediately adjacent public right-of-way.
<input type="checkbox"/>	Mechanical equipment installation that is not visible from any immediately adjacent public right-of-way.
<input type="checkbox"/>	Dormer installation that meets the requirements for exemption from public notification under <i>Zoning Administrator Bulletin No. 3: Dormer Windows</i> .
<input type="checkbox"/>	Addition(s) not visible from any immediately adjacent public right-of-way for 150 feet in each direction; or does not extend vertically beyond the floor level of the top story of the structure, or does not cause the removal of architectural significant roofing features.
<input type="checkbox"/>	Façade or storefront alterations that do not remove, alter, or obscure character -defining features.
<input type="checkbox"/>	Restoration based upon documented evidence of a building's historic condition, such as historic photographs, plans, physical evidence, or similar buildings.
Note: Project Planner must check box below before proceeding.	
<input type="checkbox"/>	Project is not listed.
<input type="checkbox"/>	Project involves scope of work listed above.

ADVANCED HISTORICAL REVIEW

Check all that apply to the project.

<input type="checkbox"/>	<p>Reclassification of property status. (<i>Attach HRRER Part I relevant analysis; requires Principal Preservation Planner approval</i>)</p> <p><input type="checkbox"/> Reclassify to Category A</p> <p style="text-align: right;"><input type="checkbox"/> Reclassify to Category C</p> <p style="text-align: right;"><input type="checkbox"/> Lacks Historic Integrity</p> <p style="text-align: right;"><input type="checkbox"/> Lacks Historic Significance</p>
<input type="checkbox"/>	Project involves a known historical resource (CEQA Category A)
<input type="checkbox"/>	Project does not substantially impact character-defining features of a historic resource (see Comments)
<input type="checkbox"/>	Project is compatible, yet differentiated, with a historic resource.
<input type="checkbox"/>	Project consistent with the Secretary of the Interior Standards for the Treatment of Historic Properties
Note: If ANY box above is checked, a Preservation Planner MUST sign below.	
<input type="checkbox"/>	Project can proceed with EXEMPTION REVIEW. The project has been reviewed by the Preservation Planner and can proceed with exemption review.
Comments by Preservation Planner:	
Preservation Planner Signature:	

EXEMPTION DETERMINATION

<input checked="" type="checkbox"/>	No further environmental review is required. The project is exempt under CEQA.	
	<p>Project Approval Action: SFMTA Board approval of a contract</p>	<p>Signature: Jennifer M Barbour Mckellar 01/22/2024</p>
	<p>Supporting documents are available for review on the San Francisco Property Information Map, which can be accessed at https://sfplanninggis.org/pim/. Individual files can be viewed by clicking on the Planning Applications link, clicking the "More Details" link under the project's environmental record number (ENV) and then clicking on the "Related Documents" link.</p> <p>Once signed and dated, this document constitutes an exemption pursuant to CEQA Guidelines and Chapter 31 of the SF Admin Code. Per Chapter 31, an appeal of an exemption determination to the Board of Supervisors shall be filed within 30 days after the Approval Action occurs at a noticed public hearing, or within 30 days after posting on the Planning Department's website a written decision or written notice of the Approval Action, if the approval is not made at a noticed public hearing.</p>	

Full Project Description

The San Francisco Municipal Transportation Agency (SFMTA) currently uses an automatic train control system (ATCS) to operate the Market Street Subway and Central Subway. The Train Control Upgrade Project (TCUP or “proposed project”) would replace the existing Muni Metro automatic train control system (ATCS) in the Market Street and Central subways with a new Communications Based Train Control (CBTC) system and expand modern CBTC train control benefits to the surface light rail portions of the Muni Metro system. Under CBTC, the Muni Metro system would be managed centrally under a single, modernized system, and would support existing transit service and allow for the increase of passenger or commuter service on the Muni Metro system’s rail lines .

The CBTC technology uses WiFi or cellular connections to precisely track and continually communicate with every light rail train in service. The project would require installation of the following components: fiber optic cables in existing conduit alongside the existing trackway, small transponder tags between the tracks, CBTC radio and wireless access equipment (small boxes) in the subway and on City-owned light standards, as well as Overhead Contact System (OCS) poles, and CBTC equipment in cabinets along the surface routes and in existing City-owned equipment rooms in the subway.

The geographic scope of the project is the entire Muni Metro trackway, both underground and along surface streets, except the F-line on the surface of Market Street and the F-line trackway north of the Ferry Portal are not included. Installation would be geographically phased with an overall construction duration of approximately 6 years. See Attachment A to the Project Description memorandum, both attached.



Date: January 22, 2024
To: Jennifer McKellar, San Francisco Planning Department
From: Mark Hansen, San Francisco Municipal Transportation Agency (SFMTA)
Through: Marcus Barrango, SFMTA
Re: **Train Control Upgrade Project**
Case Number: 2022-000870ENV

SUMMARY

The Train Control Upgrade Project (TCUP or “proposed project”) would replace the existing Muni Metro automatic train control system (ATCS) in the Market Street and Central subways with a new Communications Based Train Control (CBTC) system and expand modern CBTC train control benefits to the surface portions of the Muni Metro light rail system. Under CBTC, the Muni Metro system would be managed centrally under a single, modernized system. The proposed project would support existing Muni service and allow for the increase of passenger or commuter service on the Muni Metro system’s rail lines.

BACKGROUND

The SFMTA is responsible for the management of the Municipal Railway public transit system. It operates a network of bus routes, the Muni Metro light rail system, and several historic cable car and streetcar lines. The Muni Metro system consists of Light Rail Vehicles (LRV) running on fixed guideway surface railways and underground tunnels and provides public transit service within San Francisco. The SFMTA currently uses an ATCS that first went into service in 1998. ATCS is a type of train control technology that controls trains in the 7-mile Market Street Subway and in the 1.6-mile long Central Subway. The ATCS controls the automatic movement of LRVs with electronic loop cables that permit communication between the trains and signal infrastructure in the subway. The system enforces a minimum safety separation between trains based on safe braking distances from the last known position of preceding trains. ATCS also permits trains to move through the tunnel at a faster pace than allowable when vehicles are operated entirely under human control. Current Muni Metro transit service is not possible without this technology.

When first introduced in 1998, the ATCS increased the throughput of trains in the Market Street Subway compared to the previous fixed-block train control system and greatly

improved the efficiency of the Muni Metro network. This system is now reaching the end of its useful life and must be completely overhauled or replaced.

As the ATCS approaches its end-of-life, reliability of the system has worsened. Trips on Muni Metro have highly variable travel times, due in part to frequent delays in the subway caused by congestion and train control system shortcomings. Following the 2019 Muni Reliability Working Group's identification of train control as a significant factor impacting rail service, SFMTA has made replacement of the ATCS system a top priority.

PROPOSED PROJECT

The TCUP is an SFMTA priority capital project to replace the nearly 30-year-old ATCS in the subways with a new Communications Based Train Control System (CBTC). The project would also expand CBTC control outside of the subways to the surface portions of the Muni Metro light rail system, where signals and switches are currently operated independently of the ATCS in a first come, first serve configuration. Under CBTC, the Muni Metro system would be managed centrally under a single, modernized system.

Unlike the existing ATCS, this newer CBTC technology uses WiFi or cellular connections to precisely track and continually communicate with every LRV in service. The existing ATCS cannot be used outside the subway. With the new technology, CBTC can manage train movements throughout the entire double-tracked Metro network. In the subway, CBTC would work like the existing ATCS and use automatic headway management to adjust the speed and dwell time of trains. On the surface, the CBTC system would communicate adjustments to LRV operators who would remain in control of the train. While Global Positioning Systems (GPS) is currently used to track LRVs on the surface, CBTC's telecommunications technology is more accurate and more directly accessible to the control center staff. The greater visibility CBTC provides to the SFMTA control center and operators would result in more effective train management and better LRV service for the entire Muni Metro system.

The SFMTA expects TCUP to confer the following benefits:

- Increase the capacity of the Muni Metro system
- Maintain the high standards of safety currently provided by the ATCS in the subway and extend modern safety protections to surface operations
- Enable shorter, more consistent travel times and wait times
- Provide a reliable train control system that supports Muni Metro at all times
- Support configurable and flexible service changes and contingency operations

- Continually update the new system to include the latest service-proven components and software

The proposed project would support existing transit service and allow for the increase of passenger or commuter service on the Muni Metro system's rail lines.

Project Scope

The upgrade would be performed along the entire Muni Metro trackway, both underground and along surface streets. The geographic scope of this project would not include the F-line on the surface of Market Street or the trackway north of the Ferry Portal (a portal is the entryway where a rail line transitions between the surface and a tunnel or subway) previously used by the currently suspended E-line. (See Attachment A for project area/geographic scope of the project.)

The proposed project is currently in the project planning phase, and SFMTA will be selecting a train control supplier to provide detailed design, procurement, implementation, support, and related services for a CBTC system. The SFMTA will then contract separately with third-party installers to provide installation services for CBTC equipment. However, generally the project would require the following types of physical improvements alongside the Muni Metro trackway (it is not anticipated that the trackway itself would be moved/removed or replaced):

1. The installation of fiber optic cables in existing conduit alongside the Muni Metro trackway. The detailed design will identify specific areas along the surface running portion of Muni Metro tracks where new conduit may be necessary. Where new conduit may be needed, excavation typically may be up to 36 inches deep and 24 inches wide. The surface running portion of Muni Metro is approximately 25 miles, which includes revenue trackway and non-revenue trackway. Excavation will not be required in the light-rail yards.
2. The installation of small transponder tags between the tracks at predetermined intervals, with no need for excavation.
3. The installation of CBTC radio and wireless access equipment (small boxes) along the subway portions of the Muni Metro system, which are approximately 8.6-miles in length.
4. The installation of CBTC radio and wireless access equipment (small boxes) on City-owned light standards, as well as Overhead Contact System (OCS) poles which support the system of wires that supply power to LRVs. This CBTC radio and wireless access equipment enables communication between trains under CBTC

and the central system and would not be installed on portions of the Muni Metro system not receiving CBTC, including the F line on the surface of Market Street and the trackway north of the Ferry Portal. The primary purpose of fiber optic cabling along or adjacent to the trackway is to connect this wayside equipment to the central CBTC servers. Wayside equipment would need to be connected to this fiber optic cabling via top-off conduits, which would require trenching up to 36 inches deep and 24 inches wide from the Muni Metro trackway to City-owned light standards or OCS poles on the sidewalk. No equipment is proposed on poles that are historic (e.g., Path of Gold poles along Market Street).

5. The installation of CBTC server, radio, or signaling equipment in existing electronics equipment cabinets near Muni Metro interlocking locations and signalized intersections in the public right-of-way. Interlocking locations are track junctions or crossings where signals and track switches prevent conflicting train movements. If existing equipment cabinets are unavailable, the project would require the construction of new CBTC electronic equipment cabinets in the public right-of-way along the Muni Metro trackway. These cabinets are typically 48 inches high, 50 inches wide, and 26 inches deep. (See Figure 1 below for an example). Any new cabinets would need a fiber optic connection and would require excavation similar to the scenario described in item 4 above.
6. The installation of new CBTC equipment in existing City-owned equipment rooms in the Market Street Subway and Central Subway.



Figure 1. Example of Interlocking cabinet (left) at 4th & King streets.

Construction

Detailed design provided by the selected train control supplier will help determine the exact scope and phasing of construction activities. In general, construction activities would be necessary for the following types of work: the installation of fiber in existing conduits along the Muni Metro trackway, the installation of new conduit where needed, the installation of new CBTC wayside equipment, and connecting wayside equipment to conduit trunklines along the trackway.

Construction activities for the project are expected to be geographically phased. Phases may overlap, but the construction activities for each phase are only planned to occur on up to three city blocks at a time, to minimize impact to the public right-of-way. The longest individual phase is anticipated to be 24-28 months. The overall construction duration is anticipated to be approximately 6 years.

An initial “proving” or “pilot” phase would launch CBTC only on the surface trackway between the Ferry Portal (at Embarcadero & Folsom Street) and the Muni Metro East maintenance facility (at 25th Street and Illinois Street), as well as the surface trackway between the Central Subway Portal (at 4th and Bryant streets) and 4th and King streets. This phase also includes equipping the LRVs with CBTC equipment. This would allow for testing of the complete system and adjustments while minimizing delays and impacts to the system. The project would then move into the subways to replace the ATCS with the

new CBTC, which is the most challenging and technically complex part of the system. Finally, the project would expand to the remaining surface trackway on the rest of the system. Specific sub-phasing within the pilot, subway replacement, and surface expansion phases will be determined during detailed design.

Work under each phase may include storage tracks (short sections or pockets of track connected to the main trackway used to remove trains from service), wyes (sections of track used to turn around trains), terminal loops (the loop at the end of the trackway), and any other trackway where Muni Metro trains may travel while in service and that are controlled by the train control system.

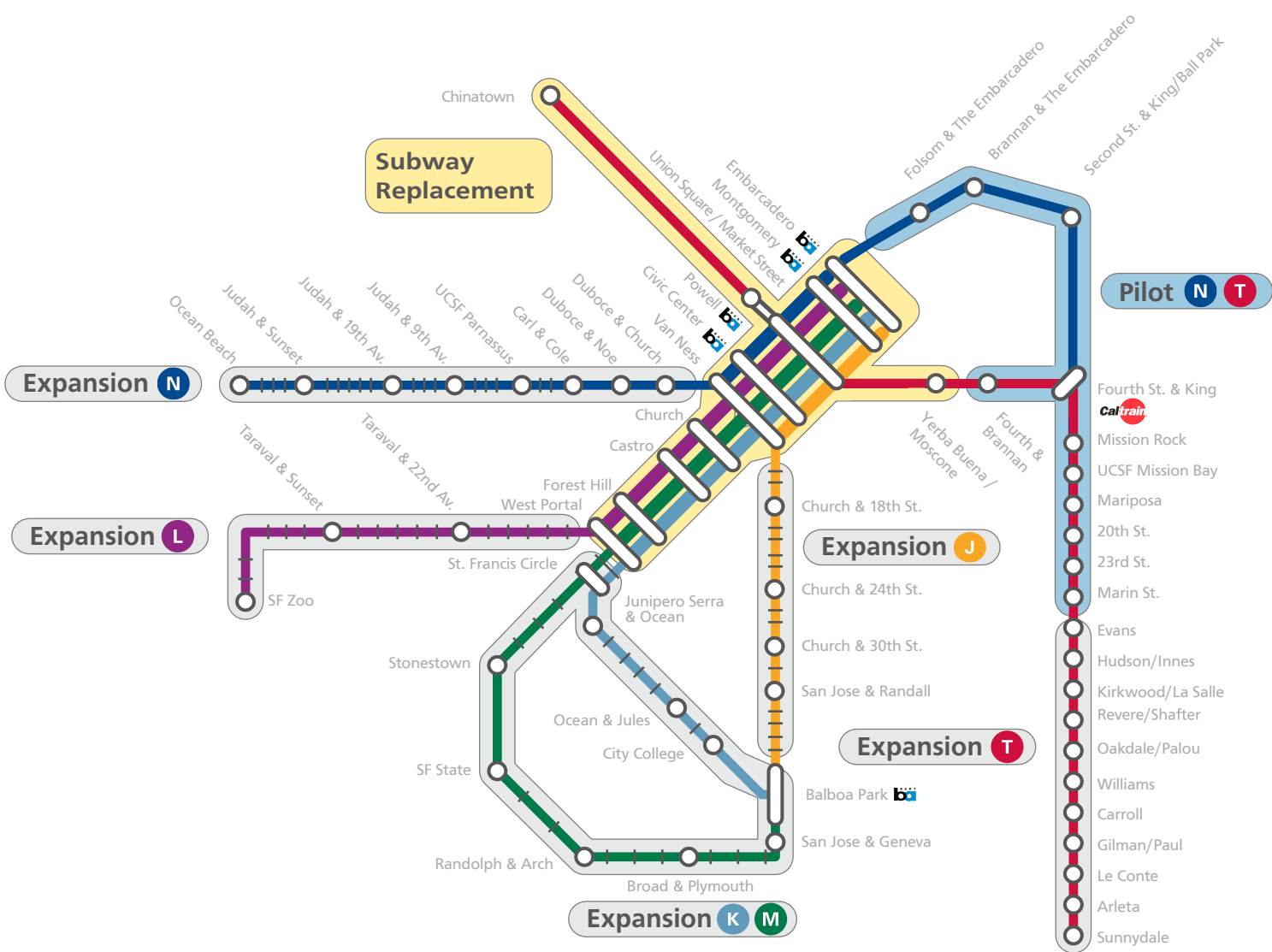
A phased approach would minimize the risks associated with replacing the existing train control system while the system is in service and ensure that operations staff can become comfortable with the system as each phase is completed. Each phase would feature detailed design and construction, allowing the design and construction of subsequent phases to overlap.

Approval Action

The Approval Action as defined by San Francisco Administrative Code Chapter 31, Section 31.04(h)(2) would be SFMTA Board approval of a contract with a train control system supplier to design and furnish a new CBTC system. The approval action starts the 30-day appeal period for the environmental review determination under Administrative Code Section 31.16.

ATTACHMENT A

Phase Map: Pilot, Subway Replacement, Surface Expansion





London Breed, Mayor

Amanda Eaken, Chair
Stephanie Cajina, Vice Chair
Mike Chen, Director
Steve Heminger, Director

Dominica Henderson, Director
Fiona Hinze, Director
Janet Tarlov, Director

Jeffrey Tumlin, Director of Transportation

October 18, 2024

**The Honorable Members of the Board of Supervisors
City and County of San Francisco
1 Dr. Carlton Goodlett Place, Room 244
San Francisco, CA 94102**

***Subject: Request for Approval – Contract No. SFMTA-2024-40-FTA with Hitachi Rail GTS
USA***

Honorable Members of the Board of Supervisors:

The San Francisco Municipal Transportation Agency (SFMTA) requests that the San Francisco Board of Supervisors authorize the Director of Transportation to execute Contract No. SFMTA-2022-40 FTA with Hitachi Rail GTS USA for design, furnishment, system implementation, support and related services for a Communications-Based Train Control System (CBTC).

The contract term is for 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years.

Summary

The Train Control Upgrade Project (TCUP) is a capital project intended to deliver a modern Communications-Based Train Control (CBTC) system to the SFMTA's Muni Metro light rail system, replacing the loop cable based Automatic Train Control System (ATCS) and expanding train control to the surface portions of the Muni Metro network. The CBTC system will leverage significant technological advances to enable the SFMTA to improve reliability, reduce delays, and increase passenger capacity.

On December 6, 2022, the San Francisco Board of Supervisors passed Ordinance 252-22 waiving the Administrative Code prohibition against issuing solicitations for a contract exceeding ten years and authorizing the use of negotiated procurement procedures for a CBTC contract.

In March 2023, the SFMTA issued a Request for Proposals (RFP) for a Supplier to provide a CBTC system to replace the ATCS and extend train control to all parts of Muni's rail network. The Planning Department has determined that the TCUP is statutorily exempt from the California Environmental Quality Act (CEQA). The negotiated contract was approved by the SFMTA Board of Directors on October 15, 2024, and SFMTA is subsequently seeking Board of Supervisors approval as required by Charter section 9.118.



CBTC Project Background

The SFMTA Muni Metro system currently relies on an Automatic Train Control System (ATCS) to operate trains automatically in the 7-mile Market Street Subway and the new 1.6-mile Central Subway. All but one of Muni's rail lines merge into the dual-track Market Street Subway, which requires that trains move quickly through the tunnel to maintain vehicle flow and headways on the branch lines. While many other light rail systems in the United States still operate using older, fixed-block train control systems, Muni was an early adopter of sophisticated loop-cable based ATCS technology. In service since 1998, the ATCS enables safe, high-frequency service in the core of Muni's light rail network and is the backbone of rail service delivery. However, loop-cable based ATCS technology is now outdated, and the ATCS is at the end of its useful life. In its current condition, train control has caused a high number of delays to Muni's rail service due to daily communication failures, train timeouts and component failures. In February 2020, the Muni Reliability Working Group concluded that upgrading the train control system is the investment in Muni infrastructure that would have the greatest benefit to rail service.

The Train Control Upgrade Project (TCUP) is a capital project intended to deliver a modern Communications-Based Train Control (CBTC) system covering both the surface portions of the Muni Metro network and the subways. The TCUP will deliver a system which continues the excellent safety record of the current system, while also increasing the subway's efficiency and reliability. This technology boost will keep subway congestion to a minimum and reduce delays where trains are held between stations. The proposed contract is the result of SFMTA's open procurement to replace its loop-cable based ATCS with the latest generation radio-based CBTC technology.

With this project, CBTC supervision will be expanded to surface rail lines as well, bringing the entire Muni rail network under a single train control and supervision system. On the surface rail lines, the CBTC system will coordinate train movements with street traffic signals, manage surface junctions and oversee vehicle speed and dwell times to keep trains evenly spaced. This control will provide the SFMTA Transportation Management Center with the tools necessary to manage the entire Muni Metro system and minimize conflicts at junctions and delays at tunnel portals.

During its first phase, the project will introduce CBTC to the street-level Embarcadero and northern Third Street corridors, which serve major civic destinations such as Oracle Park, Chase Center, and UCSF Mission Bay, as a technology demonstration phase. In the second phase, the project will replace the existing ATCS in the Market Street Subway and Central Subway by first overlaying the CBTC on top of the existing system until the new CBTC is ready for commissioning. Over the rest of the nine-year span of the project, CBTC will be extended to the surface branches of the J, K, L, M, N and T lines so that Muni Metro train control is provided by a single CBTC system.



CBTC Project Goals, Contract Structure and Scope of Work

The SFMTA intends to contract with Hitachi Rail GTS USA (Supplier) for a long-term partnership in which the Agency and Hitachi Rail GTS USA will work together to improve the reliability and performance of the Muni Metro through implementation, operation and maintenance of the vendor's state-of-the-art CBTC system.

Hitachi Rail GTS USA is the incumbent supplier of SFMTA's existing SelTrac ATCS system, having purchased the business from Thales GTS USA, formerly Alcatel Canada. SelTrac has an international reputation as a quality CBTC product and has a long track record of safe operation, including with SFMTA. However, SFMTA's version of SelTrac had not been regularly updated since it first went into operation in 1998 and has fallen several generations behind the latest version of the product. Learning from the past, the SFMTA recognizes that its CBTC system should not be a static asset but must be adaptable to changes in transit operations and must be able to incorporate improvements in technology.

This Supplier contract includes design, procurement, testing, commissioning, and long-term support of a state-of-the-art CBTC system. The contract is structured to provide incentives to the Supplier to deliver a reliable CBTC system by tying part of their compensation to its system performance metrics, and the CBTC Supplier will be required to update the CBTC system as train control technology advances.

CBTC systems are proprietary, meaning that the system software, system support, and much of the CBTC equipment can only be obtained from a system vendor under sole source contracts. Generally, the vendor has a significant advantage in negotiating such sole-source support contracts after its system is installed. In the past, City procurement regulations that limit the term of a contract to ten years have effectively prohibited combining procurement and long-term support in a single contract. However, with the ordinance passed on December 6, 2022, the San Francisco Board of Supervisors authorized the SFMTA to use negotiated procurement procedures to procure a CBTC system with support services included the authorization to advertise a contract with a 29-year term (to include 20 years of support covering most of the expected 25-year life of the system).

The Supplier contract consists of two parts. The first part of the contract comprises CBTC design, procurement of software and equipment, system testing and certification, and will have a term of nine years. The CBTC will be installed in phases corresponding roughly to each Muni Metro line to give the SFMTA beneficial use of the CBTC before it is fully installed on all rail lines, and to provide opportunities for the new system's performance and stability to be assessed at each installation phase completion milestone. At the end of each phase, the Supplier will test the CBTC to ensure that it meets performance, quality and safety standards and certify each portion of the system for revenue service. The second part of the contract requires the Supplier to provide system support, which includes a supply of spare and replacement parts,



troubleshooting and diagnostics, software updates, and related technical services to assist the SFMTA in maintaining and operating the CBTC for most of its expected 25-year life after installation. The system support phase of the contract has a base term of ten years, with two five-year extension options. Both parts of the contract work together to ensure a reliable CBTC system is delivered and kept in a continuous state of good repair.

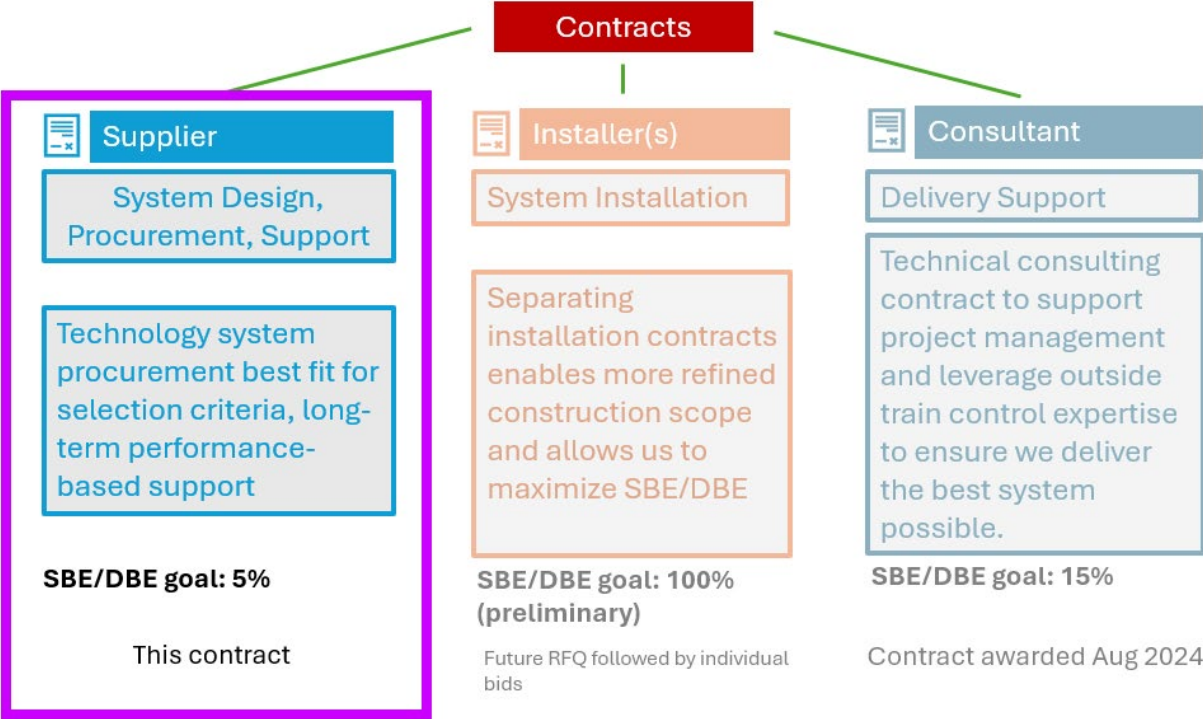
Like the current ATCS, the CBTC system is fundamental to Muni's rail operations. The design of the CBTC and its performance strongly influences the quality of Muni rail service delivery. As a key objective of this project, SFMTA sought to procure a high-quality CBTC system and secure the vendor's commitment to robust long-term support so that the CBTC-system related delays are kept to a minimum. To achieve this, SFMTA set up the RFP to evaluate best value, rather than low bid, and required prospective suppliers to competitively commit to performance targets, which were scored as selection criteria alongside the price. Hitachi Rail GTS USA offered the most competitive performance targets in their proposal, which positively contributed to their score. Those submitted performance values are now included in this contract as performance requirements. After the entire system is fully installed, the Supplier's monthly support service fees will be adjusted based on the system's performance relative to the offered performance requirements. This incentivizes the Supplier to design, furnish, test and support a high-quality CBTC system to maximize the compensation it receives.

The SFMTA will contract separately for the installation of train control equipment on the wayside and on the light rail vehicles. The Supplier will provide instructions to these Installers, witness the installation of its equipment, and assist the SFMTA in quality assurance responsibilities with respect to the Installers' work. At the end of installation, after acceptance by SFMTA, the Supplier will inspect and verify the installation of the CBTC equipment, and test and commission the installed system for operations.

The SFMTA also will contract with WSP/PGH Wong Joint Venture for professional consulting services to support the Agency on this project. This Consultant will assist the Agency in managing the relationship between the CBTC Supplier and Installer(s), augment SFMTA project staff with train control system experts, and support system integration and construction management activities.

At their August 6, 2024, meeting, the SFMTA Board of Directors passed a resolution authorizing the Director of Transportation to execute Contract SFMTA-2024-20-FTA with WSP/PGH Wong Joint Venture for Consultant support, and the San Francisco Board of Supervisors authorized the execution of this Consultant contract on September 17, 2024.

The structure of the separate Supplier, Installer(s), and Consultant contracts is shown in the image below:



Procurement and CBTC Vendor Selection Process

In 2018, the SFMTA released a Request for Information (RFI) to potential CBTC vendors. The purpose of the RFI was to solicit vendor interest and determine the capabilities and offerings of modern CBTC systems. Eight vendors responded, suggesting a high level of interest. However, three of the vendors did not meet federal contracting requirements, and two mergers of the remaining five vendors collapsed the size of the pool to three potential suppliers. The SFMTA released a follow-up RFI in July 2022 as an industry sounding to determine the viability of SFMTA’s anticipated contract, technical, and legal requirements and reassess the state of the industry after COVID. This second RFI informed the final edits to the RFP and associated contract specifications.

The SFMTA then issued a two-stage Request for Proposals (RFP) in March 2023 for the Supplier contract to provide the CBTC system and subsequently hosted a pre-proposal conference with approximately 75 attendees from potential suppliers and subcontractors. In October 2023, SFMTA received two proposals in response to the RFP. In accordance with the negotiated procurement process authorized by the Board of Supervisors for this project, the SFMTA evaluated and scored both proposals using a panel of SFMTA subject matter experts, including an outside panelist from the BART train control project. Based on the evaluation, the SFMTA



determined that both proposing firms qualified for the subsequent Request for Best and Final Offers (BAFO).

In preparation for the release of this Request for BAFOs, the SFMTA conducted in-person discussions with both proposers which allowed each of them to understand the weaknesses of their proposal so that they would have the opportunity to improve in the subsequent submission. The discussions also informed the SFMTA which of its requirements needed to be clarified and/or amended to better align with the capabilities that were available.

The SFMTA issued the Request for BAFOs, with additional clarification and scope refinements informed by the in-person discussions and initial proposal responses, on March 13, 2024. Two responsive proposals were received on June 3, 2024. As a result of the thoughtful information exchange during the in-person discussions and subsequent refinements to the RFP, the SFMTA received much improved offers. They contained more accurate pricing and performance targets, and offered solutions more precisely tailored to the SFMTA’s needs. The SFMTA undertook a revised evaluation and scoring process, using the same evaluation panel from the first round. Based on the evaluations of the BAFOs, Hitachi Rail GTS USA was confirmed as the highest-ranking proposer.

Results of RFP Evaluation

Evaluation Factors	Hitachi Rail GTS USA	Siemens
Total Score (Round 1)	76.09	55.13
Total Score (BAFO)	73.09	58.36

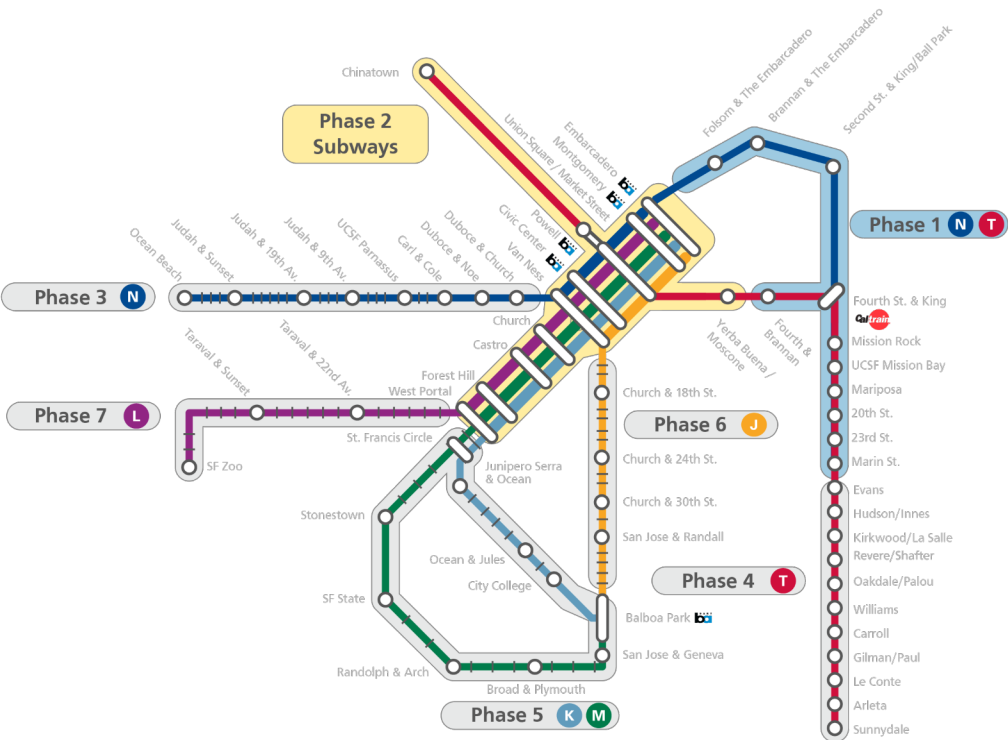
Hitachi Rail GTS USA’s proposal displayed a clear understanding of the SFMTA’s unique rail operating environment, and proposed a CBTC solution that best met the Agency’s objectives. Hitachi Rail GTS USA has extensive worldwide experience delivering successful train control projects and its proposal included the most advanced CBTC technology available in the industry today. Hitachi Rail GTS USA was selected for contract award because it received the highest score with a proposal that best met SFMTA’s requirements at the lowest price while committing to the most ambitious performance targets. In the BAFO, Siemens’ capital procurement price was almost three times higher than Hitachi’s and their ongoing support services price was 1.5 times higher. SFMTA negotiated a contract price with Hitachi Rail GTS USA based on its submitted BAFO price.

Project Approach

The approach offered by Hitachi Rail GTS USA in its proposal meets the SFMTA’s goals and requirements for the project and will result in the best value to the SFMTA. Their SelTrac CBTC system embeds lessons learned from over 25 years of experience working on the Muni Metro system with special emphasis placed on the unique rail system layout with five lines converging into the Market Street subway, and the regular surface/subway transitions at tunnel portals. The



SelTrac system offered by Hitachi Rail GTS USA is several generations ahead of SFMTA’s current train control technology in the subway and is capable of automatic control, safe train movement, system health monitoring, and seamless transitions between subway and surface operations. Hitachi Rail GTS USA’s proposal also includes the replacement of aging surface interlockings which are in need of replacement, integration with surface traffic signals for more reliable surface rail service, the use of transponders for positioning in place of unreliable track circuits, and an innovative means to track heritage and maintenance vehicles. The inclusion of scope addressing all SFMTA surface and subway signaling issues at once will result in future cost savings because we will be able to avoid multiple replacement projects to cover the same scope, and also reuses much of the existing onboard equipment. The CBTC system will be deployed in phases as shown in the below diagram, starting with an initial segment noted as Phase 1 in blue, before proceeding to replace the ATCS in the subway in Phase 2. Subsequent phases will deploy the CBTC system on the surface as shown.



Support Services Approach

The 20-year support services approach included in the contract reflects SFMTA’s commitment to ensure the CBTC system is reliable and kept up to date throughout its expected useful life. The contract requires the Supplier to provide regular software updates and security updates, and to establish an obsolescence management plan to keep the CBTC system current. For the life of the contract, the Supplier will maintain a local inventory of spare parts sufficient to support seamless maintenance and replenish the parts as necessary at no additional cost, which will act as an extended parts warranty for the duration of the support agreement. SFMTA maintenance crews



will use the spare parts provided to perform preventative and corrective maintenance. As part of the support scope, Hitachi Rail GTS USA will provide 24-hour technical support, including an embedded System Support Specialist present in the Transportation Management Center during peak transit hours. This support approach is based on the Supplier's previous 30 years of experience delivering successful train control projects.

Additionally, Hitachi Rail GTS USA has developed training materials instructing SFMTA staff on the operations and maintenance of the CBTC system, so that SFMTA can support the CBTC system. This includes the use of user guides, maintenance manuals, computer-based training modules, training simulators, and other documentation necessary to ensure that training objectives are met. As the system is updated, these training materials will be updated as well.

ALTERNATIVES CONSIDERED

No contract. Under this alternative, the SFMTA would have continued to invest resources necessary to maintain the existing ATCS system, keeping the system in a state of good repair for as long as possible. This approach would cost more than a system replacement in the long term. The ATCS is past the end of its useful life and there are already periodic ATCS failures causing minor to moderate disruption to Muni Metro service. Continuing to use the existing system will likely lead to more frequent and severe ATCS failures. These failures may occur unexpectedly, causing sudden closures of the Market Street and Central Subways, causing significant disruptions to subway service. It is possible that in the future, the ATCS may completely fail and be unrepairable, at which point rail services would be seriously disrupted for a long period of time, forcing the Agency to replace it under a more urgent timeline and likely at greater cost.

ATCS replacement only (No expansion to the surface). The SFMTA also considered curtailing the deployment of the CBTC to a 1:1 replacement of the ATCS in the subways to reduce the project cost. Not expanding CBTC territory to cover the full Muni Metro rail network reduces the overall benefits of the project and is not cost-effective. A large portion of the project cost can be attributed to system design, software, central equipment and vehicle equipment, which does not change significantly with the size of the territory to be covered. Only a small portion of project cost could be recovered by not expanding train control territory to the surface. Moreover, the surface interlocking equipment is also outdated and in need of replacement. The SFMTA would still have to replace the surface interlocking equipment within 5 years to avoid risking service-affecting failures. The surface phases of the TCUP will replace this aging interlocking equipment with the CBTC supplier's more centralized Zone Controllers and Object Controllers. Expanding CBTC to the surface prevents SFMTA from having to perform more interlocking replacement projects in the near future.



FUNDING IMPACT

This contract’s scope includes both the procurement and support of the CBTC system and will be funded by both capital funds and the SFMTA operating budget. The procurement portion of this contract is part of the Train Control Upgrade Project and will be funded by the SFMTA capital budget as described in the SFMTA CIP. As portions of the CBTC system are delivered, the SFMTA will phase in payments of support services funded from its operating budget beginning in Fiscal Year 2032.

The maximum cost of the procurement portion of the contract is \$212,093,633, assuming the contract is escalated at the maximum rate allowed under the contract of 6% annually and all procurement options are exercised. The actual escalation rate for labor will be determined by an average of BLS Series CEU3133500003, Series CEU3133600003 and Series CEU6054000003, which are the average hourly earnings for Electrical Equipment, Appliance and Component Manufacturing, Transportation Equipment, and Professional, Scientific, and Technical Services respectively. The actual escalation rate for materials will be determined by an average of the Producer Price Indices for Series PCU334419334419, Series PCU335 and Series PCU336, which are the PPIs for Semiconductor and Other Electronic Component Manufacturing, Electrical Equipment, Appliance and Component Manufacturing, and Transportation Equipment respectively. If these averages are lower than 6% annually, the total project cost will be reduced. Following is a detailed itemization of contract procurement costs and a detailed project budget covering the first nine years of the contract:

Train Control Supplier Contract (Procurement)	Cost
CBTC System design and engineering services	\$ 43,233,884
Central equipment, simulators, tools, and initial training	\$ 18,025,207
On-board computers and equipment for LRVs	\$ 18,127,571
Wayside equipment and testing services for Initial Technology Demonstration	\$ 23,447,108
Wayside equipment and testing services for Subway Replacement Phase	\$ 18,341,550
Wayside equipment and testing services for subsequent surface phases	\$ 37,284,190
Subtotal Train Control Supplier Contract (Procurement)	\$ 158,459,510
Option 1: Additional LRV onboard equipment (up to 30 vehicles)	\$ 5,516,283
Option 2: Heritage Streetcar onboard equipment (up to 50 vehicles)	\$ 13,923,770
Option 3: Maintenance vehicle onboard equipment (up to 30 vehicles)	\$ 10,803,013
Option 4: Equipment and design services for motorizing up to 10 additional surface rail junctions	\$ 10,226,551
Option 5: Backup control center equipment	\$ 656,305



Option 6: Additional design services to support Heritage Streetcar and/or Maintenance Vehicles	\$ 12,508,200
Subtotal Train Control Supplier Contract (Procurement + Options)	\$ 212,093,633

*All costs escalated to year of expenditure assuming a 6%/yr rate of inflation.

Other Associated Cost Items	Cost
Train control supplier contract (Procurement only)	\$ 212 million
Network infrastructure and systems integration	\$ 64 million
Installation contracts	\$ 99 million
Project management and engineering	\$ 102 million
Consultant contract	\$ 30 million
Testing, training and operational Support	\$ 53 million
Contingency (~25%)	\$ 140 million
Total Project Budget	\$ 700 million

*All costs escalated to year of expenditure.

Capital Funding Plan

The total budget of the Train Control Upgrade Project including all contracts, SFMTA staff cost, contingency, and escalation is approximately \$700 million over the nine-year life of the capital project. Work planned for completion during the current Capital Improvement Program cycle (FY25-29) is fully funded. Work planned for completion in future CIP cycles will be funded through future CIP processes. Identified funds include a combination of regional, state, and federal grants. The capital funding plan for the Train Control Upgrade Project is shown below. Some of the proposed sources come with risks. A Transit and Intercity Rail Program (TIRCP) grant is not yet awarded and there is some risk that Prop B General Funds will not be received. This level of risk is consistent with other projects in the Capital Improvement Plan. The project team is aware of this risk and will work with the Capital Budget team to mitigate funding risk and shift funds within the Capital Improvement Plan as necessary. Project funds in hand are sufficient to fund the project through FY25-26. Values outside of the FY25-29 CIP are tentative pending the approval of each subsequent CIP every two years.

This project is not fully funded; the capital funding plan includes a \$57 million funding need, which appears outside the SFMTA’s CIP planning horizon, starting in FY30. In addition, the funding plan depends heavily on Federal 5337 State of Good Repair formula funds, that if used will risk deferring other projects in the Fixed Guideway capital program which depend on those funds. However, since this is a large, stable project with demonstrable benefits, it is a good candidate for attracting new funding in the form of competitive grants and future bond measures. The project has already been successful in attracting about \$31 million of competitive grant funding from one round of the TIRCP. The Agency has submitted state grant applications



for additional rounds of funding from the TIRCP, which is included in this funding plan, and for the Solutions for Congested Corridors Program. The SFMTA also plans to include this project in future GO Bond campaigns for transportation capital improvements. As these new funds are received, they will both close the funding gap and replace formula funds to reduce the risk to the Fixed Guideway program.

Fund Source	Fund Type	Total (\$)
FTA 5337 State of Good Repair	Federal	\$ 375 million
Caltrans SB1 State of Good Repair	State	\$ 22 million
Transit and Intercity Rail Program (TIRCP)	State	\$ 131 million
General Fund Prop B Transit	Local	\$ 30 million
GO Bond (future)	Local	\$ 30 million
SFCTA Prop L Transportation Sales Tax	Local	\$ 16 million
Revenue Bond*	Local	\$ 24 million
Transportation Sustainability Fee (TSF)*	Local	\$ 12 million
MTC AB 664 Bridge Toll Funds*	Regional	\$ 1 million
Operating Funds*	Local	\$ 2 million
Total Committed Funding for this Project		\$ 643 million
Funding Need		\$ 57 million
Total TCUP Budget		\$ 700 million

*Indicates previously expended capital funds prior to FY25.

Expected capital funding sources for the procurement portion of this contract are shown in the following table:

Fund Source	Fund Type	Total (\$)
FTA 5337 State of Good Repair	Federal	\$ 136,358,027
Caltrans SB1 State of Good Repair	State	\$ 15,247,645
Transit and Intercity Rail Program (TIRCP)	State	\$ 53,000,000
General Fund Prop B Transit	Local	\$ 7,487,960
Total Capital Funding for Supplier Contract (Procurement)		\$ 212,093,633

Future Operating Budget Impact

The contract also includes support services that phase in starting after the new CBTC system has been commissioned in the subways, continuing for 10 years after the procurement portion of the contract ends. Assuming the contract price is escalated at the maximum rate allowed under the contract of 6% annually, the maximum cost of the baseline support provided under this contract is expected to be no more than \$114,070,833. Support services will be covered by the



SFMTA operating budget. This amount will be programmed in future SFMTA operating budget cycles between FY32 and FY44.

The contract includes two options to extend the support services for up to an additional five years each (ten years total). If exercised, these options would also be funded from SFMTA's operating budget. Assuming the option price is escalated at the maximum rate allowed under the contract of 6% annually, the additional support is expected to cost no more than \$237,681,185 and would be programmed in SFMTA operating budget cycles between FY45 and FY54. By signing the contract, the SFMTA is not committing itself to exercise these options, so the SFMTA Board will have the opportunity to review these costs and the cost-effectiveness of the support plan prior to committing to each 5-year extension of support services.

In the past, the cost of support services has not been presented to the SFMTA Board up front during the consideration of purchase agreements for technology systems. However, for systems with a long useful life and an ongoing need for support services such as train control systems, the support costs are significant compared to the initial procurement costs. Currently, the SFMTA pays its legacy train control system vendor for limited support services and for spare parts. The support service price for this contract described above includes all spare parts and support services covered by its existing train control support agreements, allowing the SFMTA to offset some of the current operating budget impacts described in this section by retiring those ongoing expenses.

REQUEST FOR APPROVAL

The SFMTA respectfully requests that the Board of Supervisors authorize the Director of Transportation to execute Contract No. SFMTA-2024-40-FTA with Hitachi Rail GTS USA.

Thank you for your consideration of this proposed Resolution. Should you have any questions or require more information, please do not hesitate to contact me at any time.

Sincerely,

A handwritten signature in blue ink that reads "Jeffrey Tumlin".

Jeffrey Tumlin
Director of Transportation

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. 241015-119

WHEREAS, The SFMTA operates the Muni Metro light rail system, which includes both shared surface right of way and dedicated subways controlled by an outdated analog loop cable-based Automatic Train Control System (ATCS), which first went into service in 1998, and has reached the end of its useful life; and,

WHEREAS, In February 2020, the Muni Reliability Working Group recommendations included improving the long-term performance of the Muni rail system by replacing the train control system; and,

WHEREAS, On December 6, 2022, the San Francisco Board of Supervisors passed Ordinance 252-22 waiving the Administrative Code prohibition against issuing solicitations for a contract exceeding ten years and authorizing the use of negotiated procurement procedures for a CBTC contract; and,

WHEREAS, In March 2023, the SFMTA issued a Request for Proposals for a Supplier of a Communications-Based Train Control (CBTC) system to replace the ATCS and extend train control territory to surface portions of Muni's rail network, which will leverage significant technological advances in train control that will enable the SFMTA to operate its rail service with greater reliability, reduced delays, and increased passenger capacity; and,

WHEREAS, In March 2024, the SFMTA issued a Request for Best and Final Offers for a Supplier of a Communications-Based Train Control (CBTC) system as part of the approved Negotiated Procurement process; and,

WHEREAS, The requested Supplier contract with Hitachi Rail GTS USA will provide the SFMTA with the design, furnishment, system implementation, warranty, support and related services for a Communications-Based Train Control System; and,

WHEREAS, The SFMTA intends to award a single contract to Hitachi Rail GTS USA for a contract term of 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years; and,

WHEREAS, The Civil Service Commission approved Personnel Services Contract (PSC) request No. 44370 in connection with this contract on July 15, 2024; and,

WHEREAS, The proposed Train Control Upgrade Project is subject to the California Environmental Quality Act (CEQA); CEQA provides an exemption from environmental review for mass transit projects that institute or increase passenger or commuter service on rail lines already in use, including the modernization of existing stations, as defined in Title 14 of the California Code of Regulations Section 15275(a) and the California Public Resources Code Sections 21080(b)(10) and 21080(b)(11); and,

WHEREAS, On January 22, 2024, the Planning Department, determined (Case Number 2022-000870ENV) that the Train Control Upgrade Project is statutorily exempt from environmental review under CEQA Title 14 of the California Code of Regulations Section 15275(a) and the California Public Resources Code Sections 21080(b)(10) and 21080(b)(11); and,

WHEREAS, the Approval Action under San Francisco Administrative Code section 31.04(h)(2)(A) occurred when the SFMTA Board of Directors approved the Train Control Upgrade Project Consultant Contract in Resolution No. 240806-098 on August 6, 2024; and,

WHEREAS, A copy of the CEQA determination is on file with the Secretary to the SFMTA Board of Directors, and may be found in the records of the Planning Department by Case Number at <https://sfplanninggis.org/pim/or> 49 South Van Ness Avenue, Suite 1400 in San Francisco, and is incorporated herein by reference; now, therefore, be it

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors authorizes the Director of Transportation to execute, in a form substantially similar to that provided to this body, Contract No. SFMTA-2022-40-FTA for a Communications-Based Train Control System and Related Professional Services contract with Hitachi Rail GTS USA for a contract term of 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years; and be it further

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors authorizes the Director of Transportation to exercise the options contained in the Contract, to approve inflation-based price escalations under the terms of the Contract, and to approve other Contract Modifications issued under the contract up to the amount of \$2,000,000 per Contract Modification; and be it further

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors commends this matter to the Board of Supervisors for its approval of Contract No. SFMTA-2022-40-FTA.

I certify that the foregoing resolutions were adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of October 15, 2024.



Secretary to the Board of Directors
San Francisco Municipal Transportation Agency



San Francisco Ethics Commission

25 Van Ness Avenue, Suite 220, San Francisco, CA 94102
 Phone: 415.252.3100 . Fax: 415.252.3112
ethics.commission@sfgov.org . www.sfethics.org

Received On:

File #: 241043

Bid/RFP #:

Notification of Contract Approval

SFEC Form 126(f)4
 (S.F. Campaign and Governmental Conduct Code § 1.126(f)4)
 A Public Document

Each City elective officer who approves a contract that has a total anticipated or actual value of \$100,000 or more must file this form with the Ethics Commission within five business days of approval by: (a) the City elective officer, (b) any board on which the City elective officer serves, or (c) the board of any state agency on which an appointee of the City elective officer serves. For more information, see: <https://sfethics.org/compliance/city-officers/contract-approval-city-officers>

1. FILING INFORMATION	
TYPE OF FILING	DATE OF ORIGINAL FILING (for amendment only)
Original	
AMENDMENT DESCRIPTION – Explain reason for amendment	

2. CITY ELECTIVE OFFICE OR BOARD	
OFFICE OR BOARD	NAME OF CITY ELECTIVE OFFICER
Board of Supervisors	Members

3. FILER'S CONTACT	
NAME OF FILER'S CONTACT	TELEPHONE NUMBER
Angela Calvillo	415-554-5184
FULL DEPARTMENT NAME	EMAIL
office of the Clerk of the Board	Board.of.Supervisors@sfgov.org

4. CONTRACTING DEPARTMENT CONTACT	
NAME OF DEPARTMENTAL CONTACT	DEPARTMENT CONTACT TELEPHONE NUMBER
Felipe Robles	415-646-2397
FULL DEPARTMENT NAME	DEPARTMENT CONTACT EMAIL
MTA S.F. Municipal Transportation Agency	felipe.robles@sfmta.com

5. CONTRACTOR	
NAME OF CONTRACTOR Hitachi Rail GTS USA	TELEPHONE NUMBER NA
STREET ADDRESS (including City, State and Zip Code) 99 Park Avenue, Suite 1120, New York, NY 10016	EMAIL

6. CONTRACT		
DATE CONTRACT WAS APPROVED BY THE CITY ELECTIVE OFFICER(S)	ORIGINAL BID/RFP NUMBER	FILE NUMBER (If applicable) 241043
DESCRIPTION OF AMOUNT OF CONTRACT \$563,845,651		
NATURE OF THE CONTRACT (Please describe) Contract with Hitachi Rail GTS USA for design, furnishment, system implementation, support and related services for a Communications-Based Train Control System (CBTC), for a contract term of 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years.		

7. COMMENTS
email address too long to fit in box above: ghislain.ledantec@urbanandmainlines.com

8. CONTRACT APPROVAL	
This contract was approved by:	
<input type="checkbox"/>	THE CITY ELECTIVE OFFICER(S) IDENTIFIED ON THIS FORM
<input checked="" type="checkbox"/>	A BOARD ON WHICH THE CITY ELECTIVE OFFICER(S) SERVES Board of Supervisors
<input type="checkbox"/>	THE BOARD OF A STATE AGENCY ON WHICH AN APPOINTEE OF THE CITY ELECTIVE OFFICER(S) IDENTIFIED ON THIS FORM SITS

9. AFFILIATES AND SUBCONTRACTORS

List the names of (A) members of the contractor’s board of directors; (B) the contractor’s principal officers, including chief executive officer, chief financial officer, chief operating officer, or other persons with similar titles; (C) any individual or entity who has an ownership interest of 10 percent or more in the contractor; and (D) any subcontractor listed in the bid or contract.

#	LAST NAME/ENTITY/SUBCONTRACTOR	FIRST NAME	TYPE
1	Rizk	Ziad	Board of Directors
2	Chan	Kar Chung	Board of Directors
3	Hannibal	Jason	Other Principal Officer
4	Hitachi Rail GTS Hold. Ltd		Shareholder
5	Syntony SAS		Subcontractor
6	Anta Electric		Subcontractor
7	SacTown Logistics, LLC		Subcontractor
8	Clark Transp. Cons.Svs.LLC		Subcontractor
9	Accio Ads LLC DBA		Subcontractor
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9. AFFILIATES AND SUBCONTRACTORS

List the names of (A) members of the contractor’s board of directors; (B) the contractor’s principal officers, including chief executive officer, chief financial officer, chief operating officer, or other persons with similar titles; (C) any individual or entity who has an ownership interest of 10 percent or more in the contractor; and (D) any subcontractor listed in the bid or contract.

#	LAST NAME/ENTITY/SUBCONTRACTOR	FIRST NAME	TYPE
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9. AFFILIATES AND SUBCONTRACTORS

List the names of (A) members of the contractor’s board of directors; (B) the contractor’s principal officers, including chief executive officer, chief financial officer, chief operating officer, or other persons with similar titles; (C) any individual or entity who has an ownership interest of 10 percent or more in the contractor; and (D) any subcontractor listed in the bid or contract.

#	LAST NAME/ENTITY/SUBCONTRACTOR	FIRST NAME	TYPE
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Check this box if you need to include additional names. Please submit a separate form with complete information. Select “Supplemental” for filing type.

10. VERIFICATION

I have used all reasonable diligence in preparing this statement. I have reviewed this statement and to the best of my knowledge the information I have provided here is true and complete.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

<p>SIGNATURE OF CITY ELECTIVE OFFICER OR BOARD SECRETARY OR CLERK</p> <p>BOS Clerk of the Board</p>	<p>DATE SIGNED</p>
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From: [Trejo, Sara \(MYR\)](#)
To: [BOS Legislation, \(BOS\)](#)
Cc: [Paulino, Tom \(MYR\)](#); [Martinsen, Janet \(MTA\)](#); [Ramos, Joel \(MTA\)](#); [Howard, Dan \(MTA\)](#); [Maguire, Mariana \(MTA\)](#); [Robles, Felipe \(MTA\)](#)
Subject: Mayor -- Resolution -- Hitachi Rail GTS USA Inc. Contract Agreement
Date: Tuesday, October 22, 2024 2:32:11 PM
Attachments: [BOS Briefing Letter SFMTA 2024 1018 TCUP Supplier.pdf](#)
[BOS Resolution Train Control Supplier Contract.docx](#)
[CEQA Checklist 2022-000870ENV.pdf](#)
[10-15-24 MTAB Item 12 Contract Approval - Train Control Upgrade Project Supplier RESOLUTION.docx.pdf](#)
[SFEC Form 126f4BOS---Notification of Contract.pdf](#)
[SFMTA-2022-40-FTA Signed by Hitachi 10.13.24 expand 5.19 and 10.1.docx](#)
[SFMTA~1.PDF](#)

Hello Clerks,

Attached is a Resolution approving an agreement with Hitachi Rail GTS USA Inc. for design, furnishment, system implementation, support and related services for a Communications-Based Train Control System, for a contract term of 9 years of design and procurement with an amount not to exceed \$212,093,633, followed by 10 years of support with an amount not to exceed \$114,070,833, and two 5-year options to extend the support with an amount not to exceed \$237,681,185, for a total contract term of up to 29 years.

Best regards,

Sara Trejo

Legislative Aide

Office of the Mayor

City and County of San Francisco