

THIS PRINT COVERS CALENDAR ITEM NO.: 13

**SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY**

DIVISION: Finance and Information Technology

BRIEF DESCRIPTION:

Approving Contract Modification No. 14 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, with Harris Corporation, to add to the Contract the design work necessary to extend the Muni radio system into the Central Subway, to add the repair of fiber optic cables in the Twin Peaks Tunnel, clarify the work to be completed for substantial completion and start of warranty, extend time for remaining work, resolve potential delay claims, clarify work remaining for substantial completion and start of system warranty, modify bond requirements, increase the Contract Amount by \$837,271.71 for a total amount not to exceed \$92,641,408.20, and retroactively extend the Contract Term by 1013 days to December 31, 2019.



SUMMARY:

- In 2012, the SFMTA Board awarded Contract 1240, Design Build Services for the Radio System Replacement Project to Harris Corporation, to replace obsolete and failing former Muni radio system that dated to the early 1970s.
- The Project is a hybrid design-build project, comprising facilities construction, software and hardware configuration, and vehicle and wayside equipment installation. The Radio System carries voice-over-air and emergency communication and provides real time data transmission for on-board and wayside systems.
- Under this Amendment, the SFMTA adds the design work necessary to extend the Radio System into the Central Subway for an additional \$641,950, adds repair to fiber optic cables in the Twin Peaks Tunnel for an additional \$195,321.71, clarifies work remaining for substantial completion and start of system warranty, modifies bond requirements, resolves the parties' respective delay claims, and extends time to complete remaining work at no additional cost to the SFMTA.

ENCLOSURES:

1. SFMTAB Resolution
2. Contract Modification No. 14 (without attachment)
3. Project Budget and Funding Plan

APPROVALS:

DIRECTOR  _____
SECRETARY  _____

DATE

March 12, 2019

March 12, 2019

ASSIGNED SFMTAB CALENDAR DATE: March 19, 2019

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PURPOSE

To approve Contract Modification No. 14 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, with Harris Corporation, to add to the Contract the design work necessary to extend the Muni radio system into the Central Subway, to add the repair of fiber optic cables in the Twin Peaks Tunnel, clarify the work to be completed for substantial completion and start of warranty, extend time for remaining work, resolve potential delay claims, clarify work remaining for substantial completion and start of system warranty, modify bond requirements, increase the Contract Amount by \$837,271.71 for a total amount not to exceed \$92,641,408.20, and retroactively extend the Contract Term by 1013 days to December 31, 2019. .

STRATEGIC PLAN GOALS AND TRANSIT FIRST POLICY PRINCIPLES

This item will meet the following goals and objectives of the FY2013 – FY2018 SFMTA Strategic Plan:

Goal 1: Create a safer transportation experience for everyone.

Objective 1.2: Improve the safety of the transit system; and

Objective 1.3: Improve security for transportation system users.

Goal 2: Make transit and other sustainable modes of transportation the most attractive and preferred means of travel.

Objective 2.1: Improve transit service; and

Objective 2.2: Enhance and expand use of the city's sustainable modes of transportation.

DESCRIPTION

The SFMTA's new radio system provides dispatch and emergency communications between the SFMTA's Operation Control Center and approximately 1200 revenue vehicles, 200 maintenance trucks, and 500 handheld radios used by SFMTA transit operations and maintenance personnel. The Radio System provides voice-over-air and emergency communication, and is also a large data transmission system covering all on-board, dispatch, and vehicle-to-wayside communications functions.

The Project to implement the new Radio System is a complex design-build technology and construction project comprising systems engineering, hardware and software configuration, systems integration, structural engineering, technology installation, and facilities construction. Included in the scope is the design and construction of antenna and transmitter sites, including towers, power supplies, and back-up generators installed in locations throughout San Francisco and in northern San Mateo County. The systems engineering portion of the Project was an iterative process by which Harris built upon preliminary systems designs and specifications provided by the SFMTA, and through a lengthy submittal and review process created final systems designs that were then

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extensively reviewed and subjected to field and factory testing before being implemented in the field. The system design required integrating the Radio System to legacy wayside, vehicle, and Central Control data systems, including scheduling and time keeping software, vehicle location systems, train control systems.

The new Radio System replaces an obsolete analog radio system that dated to the 1970s. That system had limited voice channels and bandwidth, could not be expanded, parts were no longer manufactured, and it could not integrate to other vital operating systems, such as train control and vehicle location. To maintain the old system, the SFMTA recycled radio parts from retired vehicles and bought parts from other transit agencies. Defective onboard radio equipment sometimes rendered vehicles unusable for revenue service. Federal laws required that the old broad band analog system be replaced with a narrow band or digital system. The new Radio System will provide much greater user, vehicle, and data carrying capacity, will be more reliable, and will serve future transit fleet and route expansion, including the Central Subway Project. The new radio system will improve passenger and employee safety, and will provide better on-board passenger information services. New parts and necessary support services will be readily available from the vendor and authorized service companies.

Project History

Preliminary planning for the replacement of the old radio system commenced in 2003. The SFMTA then contracted with Booz Allen to provide system design specifications, which the Agency used to issue an RFP in 2011 for a design-build contract to provide final designs, construct the infrastructure, install the equipment, and configure operating software for a new communications system. Following a competitive bid process, on April 17, 2012, the SFMTA Board of Directors approved SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project with Harris Corporation for a contract term of 1200 calendar days, and a contract amount not to exceed \$86,648,058 for base services and \$22,572,461 for optional services, for a total Contract Amount not to exceed \$109,220,519. The Board authorized the Director of Transportation to exercise the options listed in the Contract.

The SFMTA issued "Notice to Proceed" to Harris on June 20, 2012. Subsequently, the Director of Transportation approved Contract Modification Nos. 1 through 11 and Contract Modification No. 13, which added \$5,156,078.49 for a total Base Contract Sum of \$ 91,804,136.49, of which \$5,024,467.21 was for exercise of contract options, and \$131,611.28 was for various design and system changes, including quantities of handheld radios. The SFMTA Board of Directors adopted Resolution No. 15-120 on September 1, 2015 authorizing Modification No. 12 which extended the term of the contract by 538 days for a total term of 1738 days.

Project Status

The Radio System is more than 90% complete. Harris has completed the Intermediate Design, Pre-final Design, and Final Design of the new radio and computer aided dispatch system, and installation of radio system in SFMTA Rail and Vehicles. All construction work is complete; all transmitter

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stations have been installed and tested. Radio sets have been installed in 1200 vehicles, including trolley buses, hybrid buses, diesel buses, cable cars, PCC street cars, light rail vehicles, and non-revenue vehicles. Dispatch consoles have been installed in Central Control and Transit Management Center. All software and systems integration work has been tested. The Radio System has passed all tests for base stations communication, radio communication coverage between vehicles and control centers; tunnel performance, fail over, software and application functions, and integrated applications have passed testing.

The work that remains is punch list work. This Amendment also adds to Harris' work the Central Subway radio system design and repair of fiber optic cables in the Twin Peaks tunnel (that were damaged during the Twin Peaks Rail Replacement Project).

Project Delays

When awarded, the Contract provided that Harris would complete the Project in 1200 calendar days, commencing on June 20, 2012, to be completed by October 2, 2015. That requirement proved to be unachievable. The Project has taken much longer to complete than anticipated due to design challenges, unforeseen site conditions, SFMTA requested changes to system design, and difficulties in integrating legacy data systems. The Project has also been delayed due to SFMTA's scheduling difficulties in providing Harris access to tunnels and other restricted areas, conflict with capital projects at Green Division and Islais Creek Maintenance Facility that limited Harris' access to those sites, lack of vehicle availability for on-board equipment installation, incomplete design documents, and the addition of new busses and light rail vehicles to the SFMTA fleet (which required changes to installation methods and protocols). Harris had difficulty in timely procuring equipment, meeting design schedules, and providing qualified installation personnel sufficient to meet installation schedules.

Contract Modification No. 12 addressed early Project delays by extending the Contract term 538 calendar days, and by streamlining testing and installation procedures. But the size and complexity of the Project continued to present significant challenges to Harris and SFMTA staff, resulting in continuing delays. Staff have reviewed the delays respectively attributable to SFMTA and to Harris, and have determined that the delays are concurrent and responsibility for them should be equally shared. Therefore, neither party should be compensated for or will seek compensation for project delays. If approved, Contract Modification No. 14 will extend the Contract Term 1013 days for a total Contract Term of 2751 calendar days, with final completion of all work (including the additional work described in this Contract Modification) due on or before December 31, 2019.

Prior Contract Amendments

To date, the Director of Transportation and the Board have authorized 13 modifications to this Contract, for a total increase to the Contract Amount of \$5,156,078.49, which includes \$5,024,467.21 in optional work included in the original contract and \$131,611.28 for additional services. The parties have negotiated 13 Contract Modifications to exercise Contract options, address unforeseen site conditions, design changes necessary to meet field conditions, changes to system specifications and

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functions required by the SFMTA, and deleted work (that the SFMTA determined was unnecessary or that was of low priority or value). Added functionality requested by the SFMTA included items such as additional equipment on F-line vehicles to feed real-time schedule data to vehicle operators, a control unit for voice and messaging communication between operators and central dispatch, and reduced equipment boot-up time on Light Rail Vehicles.

Certain work under the base contract was also deleted from the project, resulting in a Contract Amount net decrease of \$1,673,345.00. Deleted work includes renovation work at Lenox facility (made unnecessary because dispatching functions are performed at the new Transportation Management Center), and changes to the fire safety system requirements at Forest Hill base-station. The SFMTA substituted installation of a radio base-station at Bayview Park. The 13 prior Contract Modifications are summarized in following chart.

No.	Description	Date	Amount	Days	Approved By
01	Exercised Contract Option for Traffic Signal Priority (TSP) work	7/30/2012	\$850,631.09	0	Director of Transportation (DOT)
02	Exercised Contract Option for NextBus System Interface, base station site tower replacement, and deductible option for SFMTA provided logging recorder	9/7/2012	-\$18,958	0	DOT
03	Exercised Contract Option for Public Works Emergency Radio System (PERS) work, and increase of Strand fiber from 24 to 312	10/4/2012	\$0	0	DOT
04	Exercised Contract Option for additional site locations with equipment, interfaces for the radio system including Automatic Passenger Counting System (APC), track layer for related maps, and predictive subsystem with web services Application Program Interface (API)	12/4/2012	\$701,346.89	0	DOT
05	Exercised Contract Option for increase of time periods for work related to Public Works Emergency Radio System (PERS)	2/25/2013	\$0	0	DOT
06	Modification to Contract time allowing phased work	6/11/2013	\$0	0	DOT
07	Exercised Contract Option for three-year Extended Support Program	6/19/2013	\$3,491,447.23	0	DOT
08	Modification to Contract scope adjusting vehicle quantities for retired buses	7/28/2014	-\$1,673,345	0	DOT

09	Modification to Contract for Tower 5 structural modifications at a base station	8/13/2014	\$227,434	0	DOT
10	Modification to Contract for Bayview Park base station site design	8/22/2014	\$299,911	0	DOT
11	Modification to Contract for additional control equipment, modification of APC, Mobile Data Terminal (MDT) for historic vehicle fleet modification	2/6/2015	\$1,174,117	0	DOT
12	Modification to Contract for time extension and release of claim	9/1/2015	\$0.0	538	MTA Board of Directors
13	Modification to Contract for SFMTA User Workstations and licenses, Handheld Radio Units, and Equipment for Handheld Radios	10/26/2016	\$103,494.28	0	DOT
Totals			\$5,156,078.49	538	

Changes Made under this Contract Modification

Central Subway Radio System Design. Harris will provide the designs for a radio communications system (CS System) for the Central Subway that will seamlessly integrate with the Muni System that Harris has designed, constructed, installed and implemented for the SFMTA’s existing surface and subway transit operations. The CS System will utilize equipment and software that are proprietary to Harris. A fully functional CS System is critical to the mission and operations of the SFMTA in the delivery of safe and timely public transit, traffic control, and emergency response services, and is fully integrated with and operates and is controlled in the same manner as the Muni System. The Central Subway radio system design will be paid, in the amount of \$641,950, under this Contract 1240 using approved funds from the Central Subway Project.

Twin Peaks Fiber Optic Cable Repairs. In July 2018, Shimmick Con-Quest Joint Venture, the construction contractor for another SFMTA project, the Twin Peaks Tunnel Rail Replacement Project, damaged fiber optic cables that Harris installed in the Twin Peaks Tunnel under this Contract 1240. To maintain system warranties, the repair of the cables must be performed by Harris. The cost of the repairs is \$195,321.71, which the SFMTA will recover from Shimmick.

Contract Term Extension. The Contract work was allowed to continue beyond its official completion date of March 23, 2017 as the Agency and Contractor staff continued to analyze the highly complex schedule of many different activities leading to the delay by both parties. However, this Contract 1240 is a public works contract; the expiration of the term of a public works contract does not render the contract void or unenforceable and does not excuse the performance of the contractor. Harris has continued to perform the Contract, notwithstanding the lapse of the Contract Term. Staff’s final analysis indicated that Harris and the SFMTA’s delays were concurrent, both parties shared responsibility for the delay, and that neither party should be compensated for delay

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caused by the other party. This Amendment extends the Contract term retroactively from March 24, 2017 to December 31, 2019 (a total of 1013 days), to cover the period of delay and provide Harris time to perform the design work to extend the Radio System into the Central Subway and other remaining work.

Clarification of Work Remaining for Substantial Completion. Numerous changes to the Project have effectively modified what is required for the Project to be substantially complete (that is, sufficiently complete that the SFMTA has the full use and benefit of the new Radio System). Further, the parties have disputed whether certain system functions are required by the Contract Specifications. Contract Modification 14 resolves those disputes and clarifies the work that remains to be completed for the Project to reach substantial completion. The remaining work includes completing the design for the Central Subway radio system, and providing the system functions described in Appendix D to the Amendment.

Start of Warranty and Modification of Bond Requirements. The Contract as awarded contemplated that the two-year system warranty would commence at Final Completion. Additional work and system changes requested by the SFMTA have extended the Contract Term, however, while the SFMTA has been using the radio system in its bus and trolley fleet for more than a year, which has effectively provided the SFMTA an unpaid extended system warranty for that period. The SFMTA has therefore agreed that it is equitable that warranty start following successful cutover to the Muni LRVs, at which point the Radio System will be fully installed and operational in all revenue service vehicles. The Amendment defines that point as “Beneficial Use” of the Radio System. When the Agency has Beneficial Use of the System, the risk to Agency of Harris’ failing to complete the remaining work is substantially reduced. In light of that reduced risk, the SFMTA would then allow Harris to replace the project performance bond with a warranty bond, and Harris may reduce the letter of credit it provided to guarantee to the work to \$2,000,000 in lieu of the SFMTA holding five percent of the value of the Contract as retention.

STAKEHOLDER ENGAGEMENT

Over the course of the Project, staff conducted extensive outreach to City departments and SFMTA stakeholders, which has resulted in many of the design and system function changes addressed by this Amendment. SFMTA staff conducted public outreach for Central Subway Project and the Twin Peaks Tunnel and Track Replacement Project. Staff did not conduct any outreach to the public for this Amendment, as the changes to the Project under this Amendment will not be visible to the public.

ALTERNATIVES CONSIDERED

The SFMTA Board may elect not to approve the proposed Amendment. But if the Board rejects the proposed Amendment, the Agency will not obtain needed radio systems designs for the Central Subway Project, as those designs are only available from Harris. If the Contract is not amended to include the Central Subway radio system design, completion and revenue service of the Central Subway Project will be delayed, because the new subway system cannot operate without a

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functioning radio system integrated to the main radio system. Further, the parties' disputes concerning responsibility for Project delay and included-systems functions would not be resolved, which would significantly impede completion of the Project.

FUNDING IMPACT

The current Contract Amount, as amended is \$91,804,136.49. This Amendment would increase the Contract Amount by \$837,271.71 for a total amount not to exceed \$92,641,408.20. The additional work described in the Amendment will be funded by the Central Subway and the Twin Peaks Tunnel Replacement Projects.

ENVIRONMENTAL REVIEW

On January 25, 2019, the SFMTA, under authority delegated by the Planning Department, determined that the proposed contract modification is not defined as a "project" under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b).

A copy of the CEQA determination is on file with the Secretary to the SFMTA Board of Directors and is incorporated herein by reference.

OTHER APPROVALS RECEIVED OR STILL REQUIRED

The City Attorney's Office has reviewed this Calendar Item. The Contract Compliance Office concurs with this modification. No other approvals are required.

RECOMMENDATION

Staff recommends that the SFMTA Board of Directors approve Contract Modification No. 14 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, with Harris Corporation, to add to the Contract the design work necessary to extend the Muni radio system into the Central Subway, to add the repair of fiber optic cables in the Twin Peaks Tunnel, clarify the work to be completed for substantial completion and start of warranty, extend time for remaining work, resolve potential delay claims, clarify work remaining for substantial completion and start of system warranty, modify bond requirements, increase the Contract Amount by \$837,271.71 for a total amount not to exceed \$92,641,408.20, and retroactively extend the Contract Term by 1013 days to December 31, 2019.

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. _____

WHEREAS, On April 17, 2012, the SFMTA Board of Directors approved SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project with Harris Corporation for a Contract term of 1200 calendar days and in a Contract Amount not to exceed \$86,648,058 for base services and \$22,572,461 for optional services; and

WHEREAS, The Contract has been previously amended 13 times, which increased the Contract Amount by \$5,156,078.49 to an amount not to exceed \$91,804,136.49 and extended the Contract Term 538 for a modified term of 1738 calendar days until March 23, 2017; and

WHEREAS, The Contract work was allowed to continue beyond its official completion date of March 23, 2017 as the Agency and Contractor staff continued to analyze the highly complex schedule of many different activities leading to the delay by both parties; and

WHEREAS, This Contract 1240 is a public works contract, the expiration of which does not render the Contract invalid or excuse the parties' obligations under that Contract; and

WHEREAS, Staff has analyzed the parties' respective responsibility for delays to the Project; staff has determined that Harris and the SFMTA's delays were concurrent, and therefore recommend that neither party should be compensated for delay caused by the other party; and

WHEREAS, The Radio System must be extended into the Central Subway Project to integrate the Central Subway radio system with Metro subway operations; and

WHEREAS, The Radio System uses equipment and software that are proprietary to Harris Corporation (Harris) and is not available from other vendors, and the design work necessary to expand the Radio System into the Central Subway is therefore necessarily a sole source procurement; and

WHEREAS, The proposed Amendment extends the Contract Term retroactively from March 24, 2017 to December 31, 2019 (a total of 1013 days), to cover the period of delay and provide Harris time to perform the design work to extend the Radio System into the Central Subway and complete other remaining Project work; and

WHEREAS, Central Subway design work will be paid under Contract 1240 using approved funds from the Central Subway Project; and

WHEREAS, Fiber optic cables Harris installed in the Twin Peaks Tunnel were subsequently damaged by Shimmick Con-Quest JV, the contractor that performed the Twin Peaks Trackway Replacement Project, and to maintain warranty coverage on the cables, the repair work must be performed by Harris, the cost of which the SFMTA will recover from Shimmick Con-Quest JV; and

WHEREAS, Harris has completed all construction work for the Project, and that work conforms to Contract specifications and requirements; and

WHEREAS, The SFMTA has been using the replacement radio system in trolley busses and diesel buses for 18 months, and in historic vehicles for 8 months, and Harris will complete cutover to light rail vehicles prior to March 30, 2019; and

WHEREAS, At completion of light rail vehicle cutover, the SFMTA will have beneficial use of the new Radio System, at which point it is equitable that the System Warranty Period commence; and

WHEREAS, When the SFMTA has beneficial use of the new Radio System, risks of contractor nonperformance are greatly reduced, and would be reasonable at that time to modify bond and retention requirements to reflect that reduced risk; and

WHEREAS, Following the SFMTA obtaining beneficial use of the new Radio System, the remaining Project Work is limited to punchlist work, providing additional software functions, and completing the Central Subway radio system designs; and

WHEREAS, On January 25, 2019, the SFMTA, under authority delegated by the Planning Department, determined that the proposed contract modification is not defined as a “project” under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b); and,

WHEREAS, A copy of the CEQA determination is on file with the Secretary to the SFMTA Board of Directors and is incorporated herein by reference;
now therefore be it

RESOLVED, That the SFMTA Board of Directors approves Contract Modification No. 14 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, with Harris Corporation, to add to the Contract the design work necessary to extend the Muni radio system into the Central Subway, to add the repair of fiber optic cables in the Twin Peaks Tunnel, clarify the work to be completed for substantial completion and start of warranty, extend time for remaining work, resolve potential delay claims, clarify work remaining for substantial completion and start of system warranty, modify bond requirements, increase the Contract Amount by \$837,271.71 for a total amount not to exceed \$92,641,408.20, and retroactively extend the Contract Term by 1013 days to December 31, 2019.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of March 19, 2019.

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

ENCLOSURE 2

City and County of San Francisco

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

Contract No. 1240 - Amendment No. 14

THIS FOURTEENTH AMENDMENT TO THE CONTRACT (“Amendment” or “Contract Modification”), dated for convenience as March 19, 2019 (“Effective Date”), is entered in San Francisco, California, by and between Harris Corporation, operating by and through its RF Communications Division, located at 221 Jefferson Ridge Parkway, Lynchburg, Virginia 24501 (“Harris” or “Contractor”), and the City and County of San Francisco (“City”), a chartered municipal corporation acting by and through its San Francisco Municipal Transportation Agency (“SFMTA”).

Recitals

- A. City and Contractor have entered into the Contract (as defined below) to provide to the SFMTA a Replacement Radio System (“Muni System”) and related services; and
- B. City and Contractor desire to modify the Contract on the terms and conditions set forth herein to: (1) expand the Work to include the radio systems design for the Central Subway Project (“CS System”); (2) repair damaged fiber optic cables in the Twin Peaks Tunnel; (3) clarify ambiguous specifications and system performance requirements; (4) clarify work to be completed for Project Substantial Completion and commencement of warranty; (5) extend Contract Time to resolve the parties’ respective concurrent delay claims; (6) amend retention and surety bond requirements to conform to the remaining risks of the Project; and
- C. The Contract was competitively procured as required by the San Francisco Administrative Code through a Request for Qualifications/Request for Proposals, dated April 22, 2010, and this modification is consistent with that procurement process; and

Therefore, in consideration of the mutual covenants set forth in the Contract and in full knowledge and appreciation of facts and conditions stated in the Recitals above, which are material provisions of the Contract and are incorporated herein, the Contract is amended as follows:

Article 1 Definitions

The following definitions shall apply to this Amendment:

1.1 Contract. The term “Contract” or “Agreement” shall mean SFMTA Contract 1240, Design Build Services for the Radio System Replacement Project, April 17, 2012,

between Harris and City for the design, construction, and implementation of the Replacement Radio System, as amended by the following amendments to Contract 1240 listed in the following table:

No.	Description	Date	Amount	Time Extension	Approved By
01	Exercised Contract Option for Traffic Signal Priority (TSP) work	7/30/2012	\$850,631.09	0	Director of Transportation (DOT)
02	Exercised Contract Option for NextBus System Interface, base station site tower replacement, and deductible option for SFMTA provided logging recorder	9/7/2012	-\$18,958.00	0	DOT
03	Exercised Contract Option for Public Works Emergency Radio System (PERS) work, and increase of Strand fiber from 24 to 312	10/4/2012	\$0.00	0	DOT
04	Exercised Contract Option for additional site locations with equipment, interfaces for the radio system including Automatic Passenger Counting System (APC), track layer for related maps, and predictive subsystem with web services Application Program Interface (API)	12/4/2012	\$701,346.89	0	DOT
05	Exercised Contract Option for increase of time periods for work related to Public Works Emergency Radio System (PERS)	2/25/2013	\$0.00	0	DOT
06	Modification to Contract time allowing phased work	6/11/2013	\$0.00	0	DOT
07	Exercised Contract Option for 3-year Extended Support Program	6/19/2013	\$3,491,447.23	0	DOT
08	Modification to Contract scope adjusting vehicle quantities for retired buses	7/28/2014	-\$1,673,345.00	0	DOT
09	Modification to Contract for Tower 5 structural modifications at a base station	8/13/2014	\$227,434.00	0	DOT
10	Modification to Contract for Bayview Park base station site design	8/22/2014	\$299,911.00	0	DOT
11	Modification to Contract for additional control equipment, modification of APC, Mobile Data Terminal (MDT) for historic vehicle fleet modification	2/6/2015	\$1,174,117.00	0	DOT
12	Clarify specifications, resolve claims, extend contract term	9/1/2015	\$0.00	538 days	SFMTA Board of Directors

13	Delete workstations and Integrated Radio Consoles. Various changes related to quantities of handheld radios	10/26/2016	\$103,494.28	0	DOT
Totals			\$5,156,078.49	538	

1.2 Beneficial Use. The term “Beneficial Use” shall mean the City’s use of the Replacement Radio System in Revenue Service on all modes of Muni transit vehicles. In light of all other Work completed as of the Effective Date of this Amendment, Beneficial Use shall be achieved upon the following: (a) cutover to the Replacement Radio System of Muni light rail vehicles (“LRVs”); and (b) the successful operation of the Replacement Radio System on LRVs in revenue service for one week,

1.3 Substantial Completion. The term Substantial Completion shall mean (a) Beneficial Use of the System; and (b) completion of the design of the radio system for the Central Subway Project (“CS System”), as further described in Section 3.2, below.

1.4 Other Terms. Terms used in this Contract Modification shall have the meanings as provided herein. Terms used and not defined in this Contract Modification shall have the meanings previously assigned to such terms in the Contract.

Article 2 Summary and Purpose of this Amendment.

As described more specifically below, the intent and Essential Purposes of this Amendment are:

2.1 Substantial Completion shall be achieved when the SFMTA has Beneficial Use of the System and Contractor has completed the design of the radio system for the Central Subway Project. When Substantial Completion is achieved, all other remaining Work will be deemed minor punch list work.

2.2 Contract Time and Final Acceptance (or “Final Completion”) date is extended to December 31, 2019 to allow additional time for Contractor to complete the Additional Work described in this Amendment and to resolve the parties’ concurrent Project delay claims.

2.3 Contractor shall provide to the SFMTA design documents and specifications for a functionally complete and operational CS System. The CS System shall replicate and extend the Muni System, so that the CS System operates in the same manner as and extends the Muni System into the Central Subway.

2.4 Contractor shall repair damage to the Radio System cabling in the Twin Peaks Tunnel caused by a third-party contractor.

2.5 Warranty Period will commence upon Beneficial Use of the System.

2.6 The parties resolve all claims and disputes regarding: (1) alleged ambiguous Contract Specifications and System performance requirements; (2) included Work and Additional Work; (3) Project delay and schedule/time impacts.

2.7 Retention is reduced and surety bond requirements are modified to conform to the remaining risks of the Project.

Article 3 Modifications to the Contract

The Contract is modified as follows:

3.1 Term. Section 3.3 and Article 7 of the General Conditions (Document 0700) are hereby modified to retroactively extend the Term of the Contract from March 24, 2017 to December 31, 2019 to provide time for Contractor to complete the design for the Central Subway radio system, , resolve the parties' concurrent project delays, provide time for Contractor to complete remaining work, and for other good and sufficient consideration, exchange of which is hereby acknowledged.

3.2 Substantial Completion. Substantial Completion as described in Sections 7.1.2 and 7.8 of the Contract General Conditions (Document 700) is modified as provided in Section 1.3, above and as follows (italicized for emphasis):

In consideration of the Work that Contractor has completed as of the Effective Date of this Contract Modification, the Project shall be deemed to have reached Substantial Completion upon the following:

- (a) *SFMTA has Beneficial Use of the System (i.e., completion of cutover of all Muni LRVs to the new radio system and the operation of the Replacement Radio System in the Muni LRVs in revenue service for one-week past conclusion of cut over activities, and*
- (b) *Completion of the design of the radio system for Central Subway.*

Contractor shall complete all Work required for Substantial Completion on or before September 30, 2019. All other Work remaining to be completed under the Contract shall be considered Punch List Work, as described in the following Section 3.3.

3.3 Punchlist Work. Section 7.9 of the General Conditions (Document 0700) are modified as follows (italicized for emphasis):

Contractor shall deliver all Punch List Work on or before December 31, 2019. Punch List Work includes but is not limited to the following, as described in the referenced Specifications, which are attached as Appendix D:

- (a) *Headway Management On Vehicle;*
- (b) *Change Lrv Tunnel Poll Rate Via GUI;*
- (c) *Show Relief Location On Paddle;*

- (d) *Show Trip Timepoint Comments On Paddle;*
- (e) *RFI 133 Fallback Fleetmap;*
- (f) *Ea Headsign Killswitch;*
- (g) *Jumping Call Kill 5 Second.*

3.4 Retention. Section 9.4 of the General Conditions (Document 0700) is modified as follows (italicized for emphasis):

Upon Beneficial Use of the System, the Contractor may reduce the letter of credit (that Contractor provided in lieu of the City holding retention from progress payments) to \$2,000,000, and the City shall not withhold retention from future progress payments.

3.5 Surety Bond and Warranty Bond. Upon Beneficial Use of the System (as that term is defined in this Amendment), the Contractor may substitute the performance bond with a Warranty Bond that: (a) meets the form and requirements of the City’s Risk Manager; and (b) that guarantees the Contractor’s performance of all warranty obligations under the Contract and other obligations that are specified in the Contract to extend beyond the expiration of the Term of the Contract (listed in the Contract, General Conditions, Section 10.2 (Document 0700)).

As a further condition for substitution of the performance bond:

- (a) Contractor shall provide the SFMTA written certification stating the following:

“Harris certifies it has compensated all suppliers and subcontractors that provided material, equipment or services to the Project under Contract 1240. Harris further certifies that it has resolved all payment disputes with suppliers and subcontractors, and that it will fully defend and indemnify the City against any claims that any supplier or subcontractor may bring against the City for underpayment or nonpayment of compensation for material supplied to or work performed on the Project under Contract 1240.”

- (b) Contractor shall provide the SFMTA a pass-through warranty from each of its subcontractor(s) that performed Work that constitutes a Public Work or Improvement (as those terms are defined in California Business and Professions Code section 1101 and San Francisco Administrative Code section 6.1).

- (c) Contractor shall provide the SFMTA with a pass-through warranty (original equipment warranty) from each of its suppliers that provided equipment for the Project, as specified in Contract 1240. Said warranties shall be in a form acceptable to the City and shall meet the warranty requirements stated in Contract 1240.

3.6 Warranty Period. The definition of Warranty Period as defined in the General Conditions Section 1.1.134 (referencing Section 3.18 Warranty and Maintenance),

Document 900, Appendix 12, section 8.3.1., and Document 835, Section 3.18) is modified as follows (italicized for emphasis):

The Warranty Period shall commence at Beneficial Use of the System.

3.7 Resolution of Contract Claims. The Project has taken longer to complete than anticipated due to design challenges, unforeseen site conditions, SFMTA requested changes to system design, difficulties in integrating legacy data systems, delays in delivery of new light rail vehicles, and conflict with capital projects at Green Division and Islais Creek Maintenance Facility that limited Harris' access to perform at work at those sites. The Project was also delayed by installation challenges, difficulties in providing Harris access to tunnels and other restricted areas, difficulties in providing Harris access to vehicles for on-board equipment installation, insufficient personnel, incomplete design documents, and the addition of new busses and light rail vehicles to the SFMTA fleet. Harris had difficulty in timely procurement of equipment. Harris also did not have enough qualified installation personnel and could not meet installation schedules.

3.8 Spare Parts. Contract General Conditions, Article 3 (Contractor's Responsibilities) is amended to add the following new section 3.3A, which clarifies Work that is included as base Contract Work for which no additional compensation is owed or shall be paid, and provides a 53 percent discount to the SFMTA for purchase during the Warranty Period of the spare parts and equipment listed and the quantities stated in Appendix E.

3.3A(1) *The Contractor shall perform the Punch List Work listed in Section 3.3 of the Amendment, and more particularly described in the Specifications set out in Appendix D and shall furnish the following spare parts, as more particularly described in Appendix E, which are incorporated by reference:*

3.3A(2) *Contractor shall provide SFMTA a 53 percent discount off manufacturer's list price for the parts and equipment listed in Appendix E for purchases made during the Warranty Period.*

3.9 Additional Work – Central Subway Radio System Design. Contract General Conditions, Article 3 (Contractor's Responsibilities) is amended to add the following new section 3.3B, which is Additional Work:

3.3B *Central Subway Radio System Design*

3.3B(1) *Purpose of Additional Work*

Contractor acknowledges the following:

A. *The Central Subway Project is the construction of a 1.6-mile extension of the existing light rail Third Street "T" Line. The Central Subway Project includes a surface station at 4th and King Streets, twin bore tunnels, and three subway stations, located at the Yerba Buena Center/Moscone Center, at Union Square, and in Chinatown; and*

B. The SFMTA requires a radio communications system (“CS System”) for the Central Subway that will seamlessly integrate with the Muni System that the Contractor has designed, constructed, installed and implemented for the SFMTA’s existing surface and subway transit operations under this Agreement; and

C. The Muni System uses equipment and software that are proprietary to Harris; and

D. A fully functional CS System is critical to the mission and operations of the SFMTA in the delivery of safe and timely public transit, traffic control, and emergency response services, and the object and purpose of this Amendment is to obtain a CS System that meets the SFMTA's operational requirements and is fully integrated with and operates and is controlled in the same manner as the Muni System; and

E. The SFMTA has contracted with HNTB-TSE Joint Venture to provide design services for the infrastructure required for the installation and operation of the CS System. Contractor has reviewed and provided comments and requested changes to the aforesaid designs and specifications that HNTB-TSE prepared for the CS System; and

F. The SFMTA has contracted with Tutor Perini Corporation (TPC or Installation Contractor) to construct the Central Subway Stations, trackways and control systems and perform related construction and systems integration work under SFMTA Contract 1300; and

G. The design, construction, installation, implementation and testing of the CS System was originally within the scope of work that TPC was to perform under Contract 1300; and

H. Changes in the design and implementation of the Muni System required changes in the design, specifications, implementation and testing of the CS System, so that the CS System will fully integrate with the Muni System.

3.3B(2) Central Subway Design Documents and Deliverables. *Contractor shall provide design documents (to 95 percent or better final completion) and deliverables, as described in Appendix A to this Amendment, for a fully functional voice and data communications system for the SFMTA’s Central Subway (CS System), in accordance with all applicable provisions of this Contract, including but not limited to Sections 3.1 and 3.2 of the Contract.*

Contractor shall design the CS System to integrate fully with and extend the Muni System into the Central Subway. Except as specifically noted in this Amendment, the CS System shall meet the same design criteria, performance and operating requirements described in the Contract for Muni System, unless otherwise noted

in Appendix A of this Amendment. The design and system requirements specific to the CS System are set out in Appendix A to this Amendment, which is incorporated by reference as if fully set out here.

Contractor shall complete the Central Subway Radio System design to 95 percent or better under this Amendment.

3.3B(3) Central Subway Design Review and Acceptance Criteria. *Refer to Appendix A of this Amendment, which is incorporated by reference here.*

3.3B(4) Central Subway Performance Milestones and Compensation. *Contractor shall provide the Deliverables described in Appendix A in accordance with the delivery dates stated in Appendix B to this Amendment. The SFMTA shall compensate Contractor for that Work as stated in the Performance Milestones and Compensation Schedule set out in Appendix B, which is incorporated by reference here.*

3.10 Additional Work – Twin Peaks Cable Repair.

Contract General Conditions, Article 3 (Contractor's Responsibilities) is amended to add the following new section 3.3C, which is Additional Work:

3.3C *Twin Peaks Cable Repair*

Contractor shall replace the fiber optic cable in the Twin Peaks Tunnel that was damaged by the construction contractor in the course of the SFMTA's Twin Peaks Track Replacement Project. The replacement cable and repair work shall conform to the Specifications relevant to that Work set out in this Contract 1240, including but not limited to:

- (a) Procure replacement fiber*
- (b) Repair damaged fiber and coax cable at the Castro station.*
- (c) Run a new coax jumper at and of 1 5/8" coax cable to the rack to replace damaged trunk.*
- (d) Run a new 144 strand fiber cable from the Castro cabinet to the Eureka app.1000 feet per the test results. Terminate and test per initial installation using two 12 strand trunk cables from the cabinets, only 12 strands will be terminated on this cable.*
- (e) All work will be on an extended shutdown period over two weekends (Saturday and Sunday) per Shimmick using ladders (no high rail use included).*
- (f) After cutover of new fiber, demo damaged fiber from tunnel and put the new fiber in the clips alongside the coax.*

(g) *RSSI and basic DAQ testing for verification*

Article 4 Punch List Work

4.1 The 90-Day period for completion of Punch List Work stated in the Contract General Conditions, Section 7.1.3 is modified as follows (italicized for emphasis):

Contractor shall deliver all Punch List Work on or before December 31, 2019.

Article 5 Compensation

5.1 Contractor agrees to perform the Additional Work described in Sections 3.9 and 3.10 of this Amendment for an amount not to exceed \$837,271.71, of which \$641,950 is for the Central Subway Radio System Design and \$195,321.71 for the Twin Peaks Cable Repair, as set out in Appendix B to this Amendment, which results in a modified total Contract Amount not to exceed \$92,641,408.20. Contractor acknowledges and agrees that the amounts agreed for the Additional Work described in Section 3.9 and 3.10, above, shall be in full accord and satisfaction of all current and prospective costs incurred in connection with Contractor's performance of the Additional Work described in this Amendment, without limitation, including any all markups and overhead.

Total Amount of this Contract Modification	<u>\$837,271.71</u>
Previous Contract Sum:	<u>\$91,804,136.49</u>
Revised Contract Sum:	<u>\$92,641,408.20</u>

5.2 The prices stated in Appendix B for the Work and Additional Work described in this Contract Modification include all applicable taxes and are included in the included in the Revised Contract Sum stated above.

5.3 Any work, effort or expense incurred by Contractor that is necessary to implement the changes and perform the Additional Work generally described in this Contract Modification, even if not fully described herein, shall be deemed Incidental Work covered and fully compensated by this Contract Modification, and no additional compensation shall be owed or claimed for said Work or Incidental Work.

Article 6 Legal Effect

6.1 Each of the modifications set forth in Article 2 and 3 shall be effective on and after the Effective Date of this Amendment, which shall be the date upon which all parties have that approved and signed this Amendment. Except as expressly modified by this Amendment, all other terms and conditions of the Contract shall remain unchanged and in full force and effect.

Article 7 Included Appendices

The following appended documents are incorporated by reference to this Amendment:

PAGE 12.

- A. Specifications for the Central Subway Distributed Antenna Radio System
- B. Milestone and Payment Schedule
- C. Central Subway Design Exceptions Log, Proposal, Assumptions, Test Plan Summary
- D. Statement of Work for Various Punch List Work
- E. Spare Parts List

Signatures on next page.

IN WITNESS WHEREOF, Contractor and City have executed this Amendment as of the date first referenced above.

CITY	CONTRACTOR
San Francisco Municipal Transportation Agency	Harris Corporation
_____ Edward D. Reiskin Director of Transportation Authorized By: Municipal Transportation Agency Board of Directors Resolution No: _____ Adopted: _____ Attest: _____ Roberta Boomer, Secretary Approved as to Form: Dennis J. Herrera City Attorney By: _____ Robert K. Stone Deputy City Attorney	_____ Scott Tangeman Regional Manager Harris Corporation RF Communications Division 1680 University Avenue Rochester, New York 14610 Tax ID No. 34-027-6860

City Attorney's Document No.

Enclosure 3

Project Budget and Funding Plan

A. Contract 1240 Radio System Replacement Project Design Build Services

Budget By Phase	Amount
Conceptual Engineering	\$4,380,347
Final Design	\$6,736,937
Construction	\$117,552,351
TOTAL	\$128,669,635

Funding By Source	Amount
FTA	\$26,016,241
U.S GSA Grant	\$744,000
SFCTA Prop K	\$51,702,344
Revenue Bond	\$13,062,198
Operating Funds	\$3,011,576
Bridge Tolls	\$554,878
STA Prop 1B CTSGP	\$33,427,332
Settlement Fees (local)	\$151,066
Total	\$128,669,635

Amendment 14 will be funded by Central Subway Project and Twin Peaks Tunnel Railway Replacement project. No impact to the Radio System Replacement Project budget.

B. Central Subway Radio Design

The Central Subway Project is funded with Federal Transit Administration (FTA) New Starts, Federal Congestion Management & Air Quality (CMAQ), State Transportation Bond Proposition 1A and 1B, State Regional Improvement Program, State Transportation Congestion Relief Program (TCRP), and Prop K Half-Cent Local Sales Tax funds. The Amendment will not increase the total Project cost of \$1.578B. The breakdown of Project funding sources and their amounts is as follows:

Source	TOTAL
5309 New Starts	\$942,200,000
CMAQ3	\$41,025,000
Prop 1A High Speed Rail Connectivity	\$61,308,000
Prop 1B- MTC	\$87,895,815
Prop 1B-SFMTA	\$219,896,185
RIP-SF/Other	\$74,248,000
TCRP	\$14,000,000
Prop K	\$137,727,000

Source	TOTAL
Total	\$1,578,300,000

The Central Subway Project is funding Contract No. 1240 Amendment 14 \$641,950.00 for the Central Subway Design work.

C. Twin Peaks Tunnel Fiber Replacement

The Twin Peaks Tunnel Rail Replacement Project is funded by FTA, Proposition K - Local Sales Tax, Ab664 Bridge Tolls and Revenue Bond 2013. The breakdown of project funding sources and their amount is as follows:

Federal	\$64,753,573
Proposition K	\$9,444,680
AB664 Bridge Tolls	\$7,783,252
Revenue Bond 2013	\$4,754,780
Total	\$86,736,285

Twin Peaks project is funding Contract No. 1240 Amendment 14 \$195,321.71 for the Twin Peaks Fiber Repair work.