THIS PRINT COVERS CALENDAR ITEM NO. : 10.3

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY

DIVISION: Capital Programs and Construction

BRIEF DESCRIPTION:

Authorizing the Director of Transportation to execute Contract Modification No. 12 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project with Harris Corporation, to extend the contract term by 538 days, clarify specifications, and resolve claims, with no increase in cost.

SUMMARY:

- The SFMTA's current radio system is obsolete, lacks important functions, is difficult to maintain, and cannot meet future SFMTA needs. On April 17, 2012, the SFMTA Board authorized the award of a contract for Design Build Services for the Radio System Replacement Project with Harris Corporation, for a contract term of 1200 calendar days and a contract sum not to exceed $86,648,058.
- The Project is complex, and is critical to safe and efficient transit operations. The new radio system must integrate with several SFMTA legacy systems, including scheduling software and vehicle and wayside data systems. The integration of the radio system to legacy systems has delayed completion of final design, which in turn has delayed system testing and equipment installation.
- Harris has requested additional compensation and time arising from legacy system integration challenges, unexpected site conditions, unclear contract requirements, and SFMTA's requests for design changes and other work that Harris alleges is outside of the Contract scope. The SFMTA has denied Harris' request for additional compensation. The parties have negotiated resolution to these issues to clarify contract requirements, resolve claims, and extend the contract term by 538 calendar days.

ENCLOSURES:

1. SFMTA Board Resolution
2. Project Budget & Financial Plan
3. A summary of Contract Modifications No. 1 to 11
4. Contract Modification No. 12

APPROVALS: **DATE**

DIRECTOR _____ 8/18/15

SECRETARY _____ 8/18/15

ASSIGNED MTAB CALENDAR DATE September 1, 2015

PURPOSE

To authorize the Director of Transportation to execute Contract Modification No. 12 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, with Harris Corporation, to extend the contract term by 538 days, clarify specifications, and resolve claims, with no increase in cost.

GOAL

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 1.1: Improve security for transportation system users;
- Objective 1.2: Improve workplace safety and security; and
- Objective 1.3: Improve the safety of the transportation system.

Goal 2: Make transit, walking, bicycling, taxi, ridesharing & car sharing the preferred means of travel.
- Objective 2.1: Improve customer service and communications; and
- Objective 2.2: Improve transit performance.

BACKGROUND AND PROJECT DESCRIPTION

The SFMTA's current radio system dates back to the 1970s. The radio system is critical to transit system safety and service. The 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 SFMTA has exceeded the capacity of the current radio system, which does not have sufficient voice channels or data bandwidth to meet the SFMTA's needs, and cannot be expanded to service new fleet vehicles or route extensions. The current radio system is also obsolete, and manufacturer parts and services are not available. To maintain the current system, the SFMTA recycles radio parts from retired vehicles and buys parts from other transit agencies; defective onboard radio equipment sometimes renders vehicles unusable for revenue service.

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. The new radio system will improve passenger and employee safety, and will provide better onboard passenger information services. New parts and necessary support services will be readily available from the vendor and authorized service companies.

CURRENT STATUS

On April 17, 2012, the SFMTA Board of Directors adopted Resolution No. 12-054, which authorized the Director of Transportation to execute 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 sum not to exceed $86,648,058 for base bid services and $22,572,461 for optional services, for a total amount not to exceed $109,220,519.

The SFMTA issued a "Notice to Proceed" to Harris on June 20, 2012. Harris has completed the Intermediate Design, Pre-final Design, and Final Design of the new radio and CAD system. To date, the Director of Transportation has authorized eleven Contract Modifications, for a total increase to the Contract base amount of $5,052,584.21, which includes $5,024,467.21 in optional work included in the original contract and $28,117 for additional services. The SFMTA chose to exercise a few but not all options under the contract. Certain work under the base contract was also deleted from the project, resulting in a net decrease to the total contract sum, which is currently at $91,700,642.21. A summary of all approved changes in the form of contract Modifications is attached as Enclosure 3.

CHANGES TO CONTRACT SCOPE OF WORK, TIME AND COMPENSATION

The Radio System Replacement Project is a very complicated technology project. The design of the radio system, like most design processes, has been an iterative process in which Harris and the SFMTA have considered alternative solutions to problems and have determined that certain contract specifications and preliminary designs will not serve as intended or require additional clarification and development. The parties have negotiated changes to contract specifications to address these issues. Unforeseen base station site conditions, design changes necessary to meet field conditions, and additional system functions required by the SFMTA have also necessitated changes to the Contract. The SFMTA has deleted work from the Project, where Agency staff determined that data functions initially included in the Project either were not needed or could be accomplished more efficiently by other means. The SFMTA also deleted low-priority items from the radio system to fund additional system functionality, which SFMTA determined was necessary in the course of system design.

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 for faster turnaround of trains in the subway. Items deleted from the Contract include renovation work at Lenox facility (made unnecessary because dispatching functions will be 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, instead of South Hill, because the City was not able to secure a ground lease at the South Hill Site. Radio system interface requirements have proved very challenging, and have also contributed to Project delay. These changes to the radio system design and challenges with interface requirements have resulted in concurrent delays to the

Project, for which Harris and the SFMTA share responsibility. The new radio system must integrate or share data with several existing on-board vehicle and wayside systems. Each mode and make of revenue vehicle presents unique and difficult system interface challenges, which have delayed completion of system designs.

RESOLUTION OF CLAIMS

The SFMTA and Contractor were not able to reach mutual agreement as to the time required to complete Work under Contract Modification Nos. 2, 8, 9, 10, and 11. The SFMTA therefore issued those changes as unilateral contract modifications. Harris reserved claims with regards to additional costs and/or schedule impacts related to those modifications. As part of this Contract modification No. 12, Harris releases all its past claims related to those unilateral modifications.

As part of settlement negotiations for this Modification No. 12, Harris requested additional compensation to cover overhead costs during the extended contract term as well as additional compensation for work that it considered to be outside of the scope of the contract.

SFMTA staff rejected Harris' request for additional compensation, but agreed that extending the contract time is fair, given concurrent delays caused by design changes requested by the SFMTA, and delays to the work for which Harris is responsible. The proposed Contract Modification provides that the parties will waive their respective claims concerning project delay, and each will bear its own costs associated with the time extension. Harris will also waive claims for additional compensation for changes to the Contract scope of work and changes to Contract specifications occurring prior to the effective date of the Contract Modification No. 12, which will resolve all outstanding or potential contractor claims up to the effective date of this Contract Modification. The parties have also negotiated changes to the Project schedule, and amended performance milestones and related payment requirements to accelerate testing and implementation of the new radio system. If approved, Contract Modification No. 12 will extend the total contract term to 1738 calendar days. The Contract sum, currently at $91,700,642.21, will remain unchanged.

PUBLIC OUTREACH

SFMTA staff conducted public outreach for the lease, the installation, and use of the Bayview Park radio transmission site but not for this modification

ALTERNATIVES CONSIDERED

SFMTA staff does not believe there is a credible alternative to extending the existing contract term and proceeding with Harris Corporation to complete the project. The Project is critical to SFMTA transit service and planned fleet expansion.

FUNDING IMPACT

The project is funded by federal, state and local funds. The budget and financial plan for the project is presented in Enclosure 2.

ENVIRONMENTAL REVIEW

Two California Environmental Quality Act (CEQA) determinations were issued for the Radio System Replacement Project and the use of the Bayview Park radio transmission site to satisfy environmental review requirements for the Project.

The San Francisco Planning Department made a CEQA determination on December 15, 2011 that the SFMTA Radio System Replacement Project was categorically exempt from environmental review pursuant to the provisions of CEQA under Section 15301 of the CEQA guidelines (Existing Facilities). [Planning Department Case Number 2011.1383E] Contract modification No. 12 is consistent with the December 15, 2011 CEQA determination.

SFMTA environmental review staff, with the concurrence of the Planning Department, made a determination that the addition of the Bay View Park Road site to the Project is categorically exempt from environmental review pursuant to the provisions of CEQA under Section 15301 (Existing Facilities) of the CEQA guidelines. [Planning Department Case Number 2014.0593E]

The CEQA determination documents for this project are on file with the Secretary to the SFMTA Board of Directors. This proposed approval of Contract Modification No. 12 is an Approval Action as defined by S. F. Administrative Code Chapter 31.

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 authorizes the Director of Transportation to execute Contract Modification No. 12 to SFMTA Contract No. 1240, Design Build Services for the Radio System Replacement Project, , with Harris Corporation, to extend the contract term by 538 days, clarify specifications, and resolve claims, with no increase in cost.

MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS
CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION No. _____

WHEREAS, On April 17, 2012, following a several years-long planning, RFP and contract negotiation process, the SFMTA Board of Directors adopted Resolution No. 12-054 which authorized the Director of Transportation to execute 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 an amount (Contract Sum) not to exceed $86,648,058 for base services and $22,572,461 for optional services; and

WHEREAS, Unforeseen site conditions, design changes to meet field conditions, SFMTA requests for additional work, changes from deleted work, difficulties interfacing with legacy systems, and necessary changes to specifications have delayed the timely completion the new radio system design, which has delayed installation and deployment of the system; and

WHEREAS, The Director of Transportation approved Contract Modification Nos. 1 through 11, which added $5,052,584.21 for a total Contract Sum of $91,700,642.21, of which $5,024,467.21 was compensation for optional services provided in the original Contract, and $28,117 was for additional work requested by SFMTA; and

WHEREAS, Contract Modification No. 12, as of its effective date, would provide a final resolution of all claims between the parties for additional compensation, contract time and credits, which include but are not limited to Harris' claims for additional compensation and additional time for additional work, Harris' claims for incurred costs arising from alleged unexpected site conditions, Harris' claims concerning deficiencies in Contract specifications, and the SFMTA's claims for credit for deleted work; and

WHEREAS, Contract Modification No. 12 would extend the contract time 538 calendar days for a total contract term of 1738 calendar days, with no change to the Contract Sum; and

WHEREAS, On December 15, 2011, the San Francisco Planning Department determined that the proposed SFMTA Radio System Replacement Project is categorically exempt from environmental review [Case No. 2011.1383E] under the California Environmental Quality Act as a Class 1 exemption (minor alterations to existing facilities) pursuant to Title 14 of the California Code of Regulations, Section 15301; and

WHEREAS, On April 2, 2014, SFMTA environmental review staff, with the concurrence of the San Francisco Planning Department determined that an addendum to the proposed SFMTA Radio System Replacement Project is categorically exempt from environmental review [Case No. 2014.0593E] under the California Environmental Quality Act as a Class 1 exemption (minor alterations to existing facilities) pursuant to Title 14 of the California Code of Regulations, Section 15301; and

WHEREAS, These CEQA-related documents, are on file with the Secretary of the SFMTA Board of Directors, and may also be found in the files of the Planning Department, as the custodian of records, at 1650 Mission Street in San Francisco, and are incorporated herein by reference; and

WHEREAS, It is in the public's interest to obtain a replacement radio system as soon as possible to maintain safe and efficient public transit services at a reasonable cost, and Contract Modification No. 12 will facilitate the SFMTA's meeting that objective; now therefore be it

RESOLVED, That the SFMTA Board of Directors authorizes the Director of Transportation to execute Contract Modification No. 12 to SFMTA Contract No. 1240, Design Build Services to the Radio System Replacement Project, with Harris Corporation, to extend the term of the contract by 538 days, clarify specifications, and resolve claims, with no increase in cost.

I certify that the foregoing resolution was adopted by the Municipal Transportation Agency Board of Directors at its meeting of September 1, 2015.

_____

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

Enclosure 2

Radio Replacement Project

Project Budget & Financial Plan

Budget By Phase	**Amount**
Conceptual Engineering	$4,380,347
Final Design	$6,892,977
Construction	$116,909,429
TOTAL	$128,026,740

Funding By Source	**Amount**
Federal	
	$22,194,927
State	
Prop 1B Infrastructure Bond	$26,000,268
Local	
Proposition K	$61,757,410
AB664	$554,878
SFMTA Revenue Bond 2013	$13,710,000
SFMTA operating funds	$3,809,257
TOTAL	$128,026,740

Enclosure 3

Previously Approved Contract Modifications
Contract No. MR-1240, Radio System Replacement Project

No.	Description	Date	Amount	Duration Change	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
Totals			$5,052,584.21	0	

Enclosure 4

CONTRACT MODIFICATION NO. 12

San Francisco Municipal Transportation Agency Contract No. 1240
Design Build Services for the Radio System Replacement Project

Contractor: Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, Virginia 24501

I. RECITALS

A. On April 17, 2012, the SFMTA Board of Directors by Resolution 12-054 authorized the Director of Transportation to execute the SFMTA Contract No. 1240, Design-Build Services for the Radio System Replacement Project ("the Contract"), with Harris Corporation ("Harris" or "Contractor"), for a contract sum not to exceed $109,220,519 and a contract term of 1200 calendar days.

B. The Radio System Replacement Project ("the Project") that Harris is obligated to provide under the Contract is critical to safe and efficient SFMTA transit operations.

C. Completion of the Project has been significantly delayed. Harris has completed Intermediate and Pre-final engineering designs, but the integration of the radio system to legacy systems has delayed completion of final design, which in turn has delayed system testing and implementation and vehicle equipment installation. These delays will delay Substantial Completion and Final Completion of the System. The SFMTA and Harris disagree as to the causes of said delays and which party is responsible for them. The parties acknowledge, however, that further delay to completion of the Project will impair the SFMTA's ability to complete other service critical projects and provide transit services, including delaying putting new busses and light rail vehicles into revenue service.

D. The Contract has been modified eleven times. Five of those modifications were fully negotiated, and six were unilateral modifications the SFMTA issued to direct Harris to perform specified work, because the parties could not reach final agreement as to additional Contract Time necessary to complete the changed Work, cost (compensation due Harris) for Additional Work, or credit owed to SFMTA for work deleted from the Project.

E. On June 2 and 4, 2015, representatives of Harris and the SFMTA met and negotiated the changes to Contract No. 1240 that are set out below to reset the Project schedule, modify Work performance milestones and payment provisions, clarify Contract requirements and Specifications, and resolve claims.

II. MODIFICATION OF AGREEMENT

Based on the facts recited above, which are incorporated to this Contract Modification by reference, the SFMTA and Harris agree to modify the Contract as set out below. Unless otherwise stated below, changes to Contract language are indicated by a line through deleted text and an underline of added text. New sections added and sections replaced in their entirety are so indicated. This Contract Modification shall be read together with all other Contract Documents. In accordance with section 1.5 of Document 00700, General Provisions, in case of any conflict with any other Contract Document, the conflicting provision of this Contract Modification shall have precedence.

A. CONTRACT TIME AND WORK PHASES.

1. Substantial Completion.

Document 00700, Section 1.1.115 is amended as follows:

1.1.115. Substantial Completion. When the City determines that Harris has successfully completed the Work as addressed in paragraphs 2A and 2B below (with the exception of minor Punch List Work) and the SFMTA has given Conditional Acceptance of the deliverables due under Phase 1 and Phase 2 (incorporating the Work described in the Contracts Documents as Phase 4.1, 4.2, 4.3, 4.4 and 4.5), including all executed Options. Substantial Completion shall also include any required testing and regulatory approvals, including required permit approval of the Department of Building Inspection and any other agencies that have regulatory approval authority over the Work (that are not City stakeholders exercising business discretion), including without limitation the receipt of a temporary certificate of occupancy issued by the agency having jurisdiction over the Work (if applicable) so that the Work can be utilized for the purposes for which it is intended. (See Sections 7.1.2 and 7.6.4 of the General Conditions).

2. Contract Time.

Document 00700, General Conditions, Section 7.1 is deleted in its entirety and replaced with the following:

7.1 CONTRACT TIME

7.1.1. Substantial Completion. Harris shall bring the Project to Substantial Completion on or before December 15, 2016, which is One Thousand Six Hundred Forty-Eight (1648) Days from receipt of NTP for Phase 4.1.

7.1.2. Final Completion. Harris shall fully complete the Project, including all Punch List Work on or before March 21, 2017, which is One Thousand Seven Hundred Thirty-Eight (1738) Days from Harris' receipt of NTP for Phase 4.1.

7.1.3 Harris shall not commence any Work involving installation of Mobile Equipment on Vehicles or installation of Stationary Equipment at a Facility or other site, unless and until the SFMTA has approved Harris' Final Design, as provided in Document 00700, General Conditions, sections 3.2 and 3.3. Should Harris perform any such Work in advance of the SFMTA's approval of the Final Design, Harris shall correct or re-perform at

Harris' sole cost any Work that does not meet the requirements of the approved Final Design. When the SFMTA determines that Harris's Final Design is complete and acceptable, the SFMTA shall issue Notice to Proceed to Harris to proceed with the remainder of the Work to complete the Project.

7.1.4 Notwithstanding the separation of the Work into Phases 4.2 through 4.5 (set out in Document 000700, sections 7.3, 7.4, and 7.5), following receipt of the SFMTA's Conditional approval of the Final Design and Notice to Proceed, Harris shall perform all remaining Work of the Project in two Phases, denoted as Phase 1 and Phase 2. The Work to be performed in Phase 1 and Phase 2 are generally described below and is more specifically set out in the Milestone Performance and Payment Table and the Phase Capability List, Appendices A and B, respectively, to this Contract Modification 12. The individual time elements for Phases 4.1 – 4.5 set out in Document 000700, sections 7.2, 7.3, 7.4, and 7.5 are no longer applicable. Contractor shall complete all Work in accordance with the Substantial Completion and Final Completion dates described in this Section 7.1.

A. Phase 1 - Busses and Electric Trolleys.

As set out in Appendices A and B to this Contract Modification, In Phase 1, Harris shall complete all Work(with the exception of Punch List Work and Phase 2 Work) necessary for the Radio System to function on all diesel, trolley buses, cable car, and non-revenue vehicles. Harris shall bring all Work in Phase 1 to Substantial Completion on or before June 27, 2016. Phase 1 does not include the functions for said vehicles listed as Phase 2 Work in Appendix B (Phase Capability List -).

Harris shall provide that missing functionality in Phase 2 (as described below), so that the Radio System at Final Completion will meet all performance requirements for all modes of transport, as specified in the Contract.

B. Phase B - Rail Vehicles.

As set out in Appendices A and B to this Contract Modification, in Phase 2, Harris shall bring all Work (with the exception of Punch List Work), necessary for the Radio System to function on rail vehicles, including LRVs, and historic cars (with the exception of the historic fleet installation Work subject of contract Modification 11), to Substantial Completion on or before December 15, 2016. In Phase 2, Harris shall also complete all remaining Work for buses and electric trolleys on or before December 15, 2016, with the exception of work on the Twin Visions Smart Series 2 signs. Harris shall complete all remaining Work on the Twin Visions Smart Series 2 signs and the historic fleet installation on or before January 31, 2017. Harris shall complete all other Work on the Project on or before December 15, 2016, so that all other components of the Radio System meet all Contract specifications and function as the Contract requires on all types of revenue and non-revenue vehicles. Harris shall complete any Punchlist Work and thereby bring all Work to Final Completion on or before March 21, 2017.

B. NO INCREASE TO CONTRACT VALUE.

1. The changes effected by this Contract Modification do not increase the Contract Sum, which is **$91,700,642.21**, which amount includes adjustments to the Contract Sum arising from or related to the modifications to the Work described in this Contract Modification 12 and all Contract Modifications effected prior to the Effective Date of this Contract Modification 12.

2. Harris and the SFMTA shall each bear its own overhead, transactional and other costs arising from extending the Contract Term.

C. LIQUIDATED DAMAGES FOR DELAY.

Contract Document 000700 Sections 8.1.3 and 8.1.4 of the Contract are modified as follows:

8.1.3. Delay of Substantial Completion. Harris shall pay the SFMTA Thirty-Five Thousand Dollars ($35,000) for every Day that Substantial Completion is delayed due to the action or inaction of Harris beyond December 15, 2016, the date that Harris is required to complete the Work to bring the Project to Substantial Completion ~~(that is, the 1110 Days time limit set out in Article 7, above, for Substantial Completion of Phases 4.1, 4.2, 4.3, 4.4 and 4.5)~~.

8.1.4. Delay in Final Completion. Harris shall complete all Punch List Work within 90 days from the date the City provides notice to Harris that the Project has reached Substantial Completion (the "Substantial Completion Date"). Harris shall pay as liquidated damages Five Thousand Dollars ($5,000) per Day for each Day beyond March 21, 2017, ~~90 days from the Substantial Completion Date~~ that Harris, due to its actions or inactions, has not completed all Punch List Work and otherwise brought all Work for the Project to Final Completion.

D. CONTRACTOR'S WAIVER OF CLAIMS.

1. Waived Claims. As of the Effective Date of this Contract Modification No. 12, Harris waives any and all claims that may have arisen prior to the Effective Date of this Contract Modification No 12, without limitation, whether now known or unknown, against the City, for additional compensation or Contract Time, including but not limited to:

(a) claims arising from or related to Additional Work requested or directed by the SFMTA in Unilateral Contract Modifications issued by the SFMTA;

(b) agreed Contract Modifications signed by both parties;

(c) accepted Submittals;

(d) change requests from Harris approved by the SFMTA by letter or contract modification, or email

(e) Additional Work claimed or performed by Harris due to alleged ambiguities, deficiencies or defects in Contract Documents;

(f) additional direct, indirect and/or overhead costs incurred by Harris in performing the Work or Additional Work;

(g) delays to the Project from any source and associated costs;

(h) lost profits and any other consequential, incidental or special damages; and,

(i) any other claim for damages of any kind, arising from any facts or events that occurred or may have occurred prior to the Effective Date of this Contract Modification No. 12.

Harris further waives all rights to claims arising prior to the Effective Date of this Contract Modification No. 12 that may be reserved, protected or may otherwise survive under California Civil Code section 1542, which provides: "A general release does not extend to claims which the creditor does not know or suspect to exist in his or her favor at the time of executing the release, which if known by him or her must have materially affected his or her settlement with the debtor."

2. Potential Claims Exempted from Waiver. The above waiver(s) by Harris in this Section D shall not apply to claims for additional Contract Time and/or compensation related to Additional Work that the SFMTA has requested but that the parties have not yet fully negotiated. Said exempted claims are limited to the following:

a. During the period in which Harris will be installing Vehicle Equipment on SFMTA vehicles, the SFMTA expects to receive approximately 219 new New Flyer busses on a rolling delivery schedule. As the SFMTA receives the New Flyer busses from the manufacturer, the SFMTA will direct Harris to install Vehicle Equipment on those new busses that was originally intended for existing vehicles. Time impacts and additional costs, if any, for installing Vehicle Equipment installation on the New Flyer Buses (instead of existing vehicles) are unknown at this time. Harris reserves its rights to seek additional time and/or compensation, subject to proof, related to time and cost impacts, if any, related to Vehicle Equipment installation on the new New Flyer buses.

b. SFMTA has requested Harris' assistance in developing a Standard Operating Procedure (SOP) for the operation of the CAD/AVL that Harris will deliver under the Contract. The SOP will be implemented in the SFMTA's new Transportation Management Center. Harris reserves its rights to seek additional time and/or compensation, subject to proof, related to time and cost impacts, if any, related to the development of said SOP.

3. No Existing Claims. Harris represents in good faith that as of the effective date of this Contract Modification, with the limited exception of those subjects addressed in Section D.2, above, Harris is not aware of any claims or facts that may give rise to a claim against the

SFMTA arising from or related to the Contract that is not waived under this Contract Modification.

E. CITY'S WAIVER OF CLAIMS.

1. Waiver of Delay Damages. As of the Effective Date of this Contract Modification No. 12, the City waives any and all claims for breach of contract related to delay of the Project or liquidated damages for delay of the Project that the City may assert against Harris under Section 8.2 of the Contract. The classes of damages that are liquidated under Section 8.2 and waived by the City under this Contract Modification are limited to all direct, consequential, incidental and other special damages arising from or related to Harris's delay to Substantial Completion of the Work on or before December 15, 2016 and those damages arising from or related to Harris's failure to bring the Project to Final Completion on or before March 21, 2017. With the exception of those classes of damages specifically described herein, the City reserves all other rights to damages and remedies provided by the Contract and available by law.

2. No Existing Claims. The SFMTA represents in good faith that as of the effective date of this Contract Modification, with the limited exception of delay damages described in the Section E.1, above, the SFMTA is not aware of any claims or facts that may give rise to a claim against Harris arising from or related to the Contract.

F. PROJECT SCHEDULE AND PAYMENT MILESTONES.

Contract Document 000700 Section 9.2 of the Contract is modified as follows:

The City shall make payments to Harris as provided in the Milestone Performance and Payment Table set out in Appendix A to this Contract Modification No. 12 and ~~in the Milestone Payment Schedule set out in Document 530 and~~ in ~~accordance with Document 809, as to progress payments, Milestones and Unit prices stated therein~~. In case of conflict between this Contract Modification and Document 809, this Contract Modification and its appendices shall govern. The total cost of performing the Project and each Item and each Phase of Work, including providing all labor, materials, fixed cost elements, tools and equipment necessary for the Project, Furnishing Equipment and materials, incurred incidental expenses, and overhead and profit, shall be included in the Contract Sum. The City will make payments to Harris based on Harris's completion to the City's satisfaction of the Work described in the Contract according the Project Schedule for the amounts listed in the Milestone Performance and Payment Table set out in Appendix A. ~~Payment Schedule~~. The City shall not make payments in excess of the value of the Work that Harris has completed to the City's satisfaction~~.~~, ~~based on the value of the Work set out in Document 0530~~. Harris shall submit with any payment application such forms as may be required by the SFMTA, including but not limited to SBE participation reports.

G. CHANGES TO SPECIFICATIONS AND SYSTEM REQUIREMENTS.

The following changes to specifications and system requirements were developed and negotiated in the course of Project design and development. The parties agree

there is no net increase or decrease in Contract Sum associated with these changes. These changes are memorialized here to clarify Specifications and the parties' intent.

1. Traffic Signal Priority (TSP) Functions.

Harris shall cease all Work regarding Transit Signal Priority (TSP) functions for the Radio System, as those functions are described Contract Modification No. 1, Document 00530, and Document 00900, Appendix 12, Section 3.2.28. Said Work and Optional Bid Items No. 033a, 033b, and 033c are hereby deleted from the Contract. SFMTA shall pay Harris $593,766 for Work associated with TSP functions that Harris has completed as of the Effective Date of this Contract Modification No. 12. Remaining (unbilled) funds previously dedicated to the deleted TSP Bid Items are transferred to a Contract allowance to compensate unexpected or changed Site conditions.

2. AVA Image.

The System Specifications stated in Document 00900: Appendix 12 Section 3.2, Base ITS Components, for the Automatic Onboard Traveler Information System, are modified with the addition of paragraph a and the modifications shown in paragraphs b, c and d, below:

a. Harris shall provide the SFMTA with the following tools to assist with the creation of AVA data image: 1) Xerox Map Maintenance Tool and 2) the CRS-600 application, which will include the RMM Module. Harris shall make available the ~~The~~ RMM module ~~is made available~~ so that the SFMTA can "import" its existing trigger data into the Harris provided RMM Tool. The SFMTA can continue to utilize the Xerox provided RMM tool for the purpose of generating "trigger box" data instead of using the Xerox provided Map Maintenance Tool. The RMM will be supported for the duration of the contract for use for the generation of the AVA "trigger box" data. This "trigger box" data with corresponding WAV files and CRS database into an AVA Image, is then exported/converted by the CRS-600 application into a CRS 3.0 AVA Image format which will be used by the Harris provided onboard system.

b. The data to drive the automatic on-board traveler information system, i.e. the AVA image (inclusive of the WAV files, the onboard signage text data, and the Trigger Box data), will be provided by the SFMTA to the Harris.

c. All existing and new on-board passenger displays and audio shall be under the control of the automatic on-board traveler information system. The network and schedule data along with announcement files shall be transferred ~~provisioned~~ through the wireless bulk data transfer infrastructure at the divisions (yards) and other locations ~~parking points~~ that are equipped with a back-end wireless infrastructure.

d. On-board internal audible announcements shall generally provide the identical information displayed by ~~mirror~~ the on-board signs, in accordance with the ADA.

Exceptions are defined by the SFMTA provided AVA image and are described in CDRL 12-3-26 Digital Visual and Announcement System Description. For example, in support of the required alternating message capability, should a door-open message be configured, the door-open text message will preempt the approach text message. After the door open text message completes, the VLU will restart the approach text message.

3. Mini-Fleet Testing.

The Mini-Fleet Testing requirements stated in Document 00900: Appendix 12 Section 7.9.6, (commencing at page 220) Mini Fleet Test, are modified as follows:

7.9.6 Following the completion of the Field Performance Test and Radio Coverage Acceptance Test, a comprehensive test of the integrated PSVRN and MTMS shall be conducted with a small subset of the SFMTA's fleet. The Mini-Fleet Test(s) will ~~is intended to~~ verify proper operation and integration of each of the SFMTA's non-revenue and revenue vehicles with the PSVRN and/or MTMS fixed-end equipment.

a. The mini-fleet tests will include ~~consist~~ each type/make of ~~different~~ bus ~~type~~, rail vehicle ~~type~~, cable car, and ~~each different~~ non-revenue vehicle ~~type~~. The test ~~se~~ vehicles shall be equipped with all required on-board Vehicle Equipment including optional equipment purchased. The test ~~se~~ vehicles shall be operated in actual or simulated revenue or non-revenue service to fully test, at a minimum, the following under actual service conditions:

    (1) Schedule and route adherence

    (2) Automatic Vehicle Location

    (3) Voice communications and data messaging

    (4) Emergency alarm processing

    (5) Real-time traveler information feed

    (6) All other PSVRN and MTMS equipment, functions, and all other options purchased.

b. The mini-fleet ~~is~~ test shall verify that all PSVRN and MTMS components have been supplied, installed, and perform all functions in accordance with applicable specified requirements. The Mini-Fleet Test vehicles may be operated on a selected subset of the SFMTA's routes, provided these selected routes encompass the entire service area and will allow testing of all the operational and functional conditions expected to be encountered during the service day and throughout the entire service area.

c. ~~One bus shall be operated on each route to verify proper operation and specified accuracy for existing traveler information system feed.~~ Two routes per vehicle type, and one inbound and one outbound pattern within each tested route, or in the alternative an SFMTA selected two-pattern combination, shall be operated to verify proper operation of the Automatic On-board Traveler System. Each route shall consist of both inbound and outbound direction of travel. To better test geographic system coverage, Contractor shall maximize the number of routes used for vehicle testing; a test route used for one type of vehicle shall not be used to test another type of vehicle.

d. Two routes per vehicle type, and one inbound and one outbound pattern within each tested route, or in the alternative an SFMTA selected two-pattern combination, shall be operated to verify proper operation and specified accuracy of the existing traveler information system feed. Each route shall consist of both inbound and outbound direction of travel. To better test geographic system coverage, Contractor shall maximize the number of routes used for vehicle testing; a test route used for one type of vehicle shall not be used to test another type of vehicle.

e. The test shall also verify mechanical, electrical, and electromagnetic compatibility with all other existing on-board equipment on all vehicles including, CCTV, vehicle monitoring systems.

f. This testing will be repeated as necessary until the integrated PSVRN and MTMS is ready to support revenue service for the entire fleet. The SFMTA shall provide on-site support during this test to assist in the testing and to help identify variances.

4. Digital Visual and Audio System

The DVAS requirements stated in Document 00900: Appendix 23, Section 6.1, "General" (commencing at page 9) are modified as follows:

6.1 General DVAS Requirements.

a. Harris shall furnish and install ~~supply~~ all equipment and software necessary to ~~and shall install and~~ test and implement a fully functional Digital Visual and Audio System (DVAS), even if the specific equipment, parts, hardware, software, or assemblies required are not specified ~~with~~in this RFP. The purpose ~~objective~~ of the DVAS ~~this~~ system shall be to

improve passenger information in accordance ~~and to comply~~ with the requirements of the ADA. The DVAS shall also control the destination and run number signs.

b. Harris shall provide a vehicle test setup of the equipment to be installed in the operator's cab, including ~~a quantity of (1) of each~~ all visual and audio components to be installed as part of the DVAS, connected to the vehicle test setup.

c. ~~When installing the fleet, the~~ Harris shall install as part of the DVAS all necessary ~~include adding~~ controls, warning audio/visual alarms within the vehicle cab necessary to operate ~~to meet the needs of~~ the DVAS. ~~However, the~~ DVAS equipment as installed shall not interfere with vehicle functions, the vehicle operator's control of the vehicle, ~~functions and the equipment shall not~~ and shall not ~~obscure~~interfere block or otherwise interfere with the operator's view through the windshield or side windows~~of the operator's field of vision~~.

d. The DVAS shall comply with all applicable standards, regulations, codes, laws, and requirements whether identified herein or not. To the maximum extent possible, Harris shall utilize the existing on-board vehicle equipment such as cabling, conduits, speakers, microphones, handsets, mounts, brackets, and assemblies for the installation and operation of DVAS equipment. ~~In SFMTA's opinion the current speakers and conduits can be utilized. However, the SFMTA cannot assure that all the equipment is in working order or fit for the application, and the~~ Harris shall verify and record the availability and function of existing on-board vehicle cabling, conduits, speakers, microphones, handsets, mounts, brackets, and assemblies for use by the DVAS equipment. ~~Based on this verification, the Harris shall reuse or replace the existing equipment. As part of their proposal, the Qualified Proposers shall include a budget for the replacement of existing equipment.~~

e. The Harris is encouraged to submit alternate designs, if such designs may benefit SFMTA. SFMTA shall have the latitude to choose any design or technology which is deemed most beneficial to SFMTA. The following is a sample list of equipment and does not necessarily imply any specific technology. The use of active wayside components such as signposts, hub odometers, or obsolete technologies such as LORAN-C or inductive loops are not acceptable. The DVAS shall include, but shall not be limited to the following:

(1) Automatic Vehicle Location (AVL) equipment needed to sufficiently drive the automatic passenger information functions

(2) Wireless Bulk Data Transfer equipment (vehicle-borne and at fixed side at yards)

(3) Operator Control Unit (OCU)

(4) DVAS Logic and Control Unit

(5) Audio Pre-amplifier

(6) Audio Amplifier

(7) On-board message signs

(8) Memory

(9) Wiring, Cabling, and Support Mounts

(10) Software and firmware

(11) On-board computers, routers, access points, modems

(12) Wireless bulk data transfer equipment at yards

(13) Manuals, training material, system administration, diagnosis and analysis tools, and test equipment

(14) Any interfacing equipment for the integration with the ATCS, if needed

f. Single points of failures shall be minimized in the DVAS. In an event the DVAS Logic and Control Unit fails, the vehicle operator shall still be able to make manual announcements over the PA, the passenger activated "Stop Request" in the internal sign shall remain functional, and the destination signs shall also remain functional.

g. The SFMTA will provide all data to support DVAS operation ~~achieve functions identified herein~~ including, but not limited to basic data, schedules as needed, audio recordings, initial parameter sets, on-board sign messages, OCU display texts, and the AVA Image in CRS 3.0 format. All data generated by SFMTA systems that SFMTA provides to Harris to support the DVAS (and other Radio System functions), including but not limited to AVL data, APC data, schedule and map data shall remain and be the exclusive ~~remain or become the~~ property of SFMTA, and the Harris shall have no rights to ~~on~~ any supplied or generated data provided by the SFMTA associated with the ~~Awarded~~ Contract.

h. The Harris shall ensure that the DVAS operates properly using only ~~available~~ power available on the vehicles ~~shall be used for powering the new and existing equipment~~.

Harris shall submit a ~~The~~ power utilization scheme ~~shall be submitted by the Harris~~ for SFMTA review and approval as part of the design report.

5. On-Board Destination and Run Sign Interfaces

The VLU and Signs requirements set out in Document 00900: Appendix 12 Section 3.2.19, Interfaces, (subsection titled) "On-Board Destination and Run Sign Interfaces" (commencing at page 127) are modified as follows:

3.2.19 ON-BOARD DESTINATION AND RUN SIGN INTERFACES

a. The VLU shall interface with the existing destination and run signs. The VLU shall automatically send sign codes for every route and direction change during revenue service to set these signs accordingly.

b. The MDT shall be capable of providing codes for the operator for manual selection of destinations and runs. This feature shall be available as a manual override to the automatic setting of displays. Vehicles that have manual curtain signs shall have an interface cable run from the VLU to a pre-determined area, coiled, and securely fastened in the event that electronic signs are installed at a later date. The Harris shall provide a centralized method of deploying a sign database to the on-board TwinVision signs via wireless bulk data transfer functionality.

c. Harris shall provide additional functionality that will allow the SFMTA to perform a sign database "deployment" to the onboard TwinVision signs via Wireless Bulk Data Transfer functionality ("Wireless Update"). The actual transfer of the sign database from the DIS to the VLU will be over WBDT, while VLU to the TwinVision sign will be completed utilizing a wired connection. The VLU will: (1) automatically detect new Sign database data on the DIS, (2) automatically transfer the data to local onboard storage, and (3) on the activation date (as defined by the activation date associated with the TwinVision sign image), the VLU will automatically update the Twin Vision sign memory with the new Sign data.

d. The Destination Sign interface to the VLU will automatically send sign codes for signal control during revenue service for the Twin Vision SmartSeries 2 Signs.

e. Adequate protections and maintainability shall be provided to sustain cable runs that cross articulations and that run in other stressed areas, including LRV couplers, over the lifetime of the MTMS.

f. The Harris shall submit a complete technical description of the onboard destination and run sign interface. [CDRL 12-3-16 On Board Destination and Run Sign Interface Description].

g. The SFMTA will be responsible to deploy any updates required to the firmware of the TwinVision Destination Signs, the Run Sings, or the OCU to the field as part of pre-installation inspection process to support the Wireless Sign Data Capability. The necessary version of the TwinVision Smart Series 2 is OCU App Ver. 03.14. Harris will validate operations of both the TwinVision Destination Sign as well as the TwinVision Run sign during field deployment of the Wireless On-Board Twin Visions Sign Functionality.

6. Deletion of South Hill Base Station; Addition of Bayview Park Base Station.

Contract requirements concerning the South Hill Base Station, in Contract Document 900, Appendix 12, section 5.10 (commencing at page 192) is hereby amended as follows:

a. Harris shall cease all Work related to the design and construction of the South Hill Base Station. Harris shall instead proceed with the design and construction of a base station in Bayview Park near Candlestick Point.

b. Harris shall install all necessary equipment and perform all work necessary to use the Bayview Park radio tower and transmission facility as a Base Station for the System as a replacement for the South Hill site to meet the system functional performance requirements. Where the Contract Documents refer to the South Hill site, the Contract Documents shall be understood to mean the Bayview Park site. The Base Station at the Bayview Park Site shall provide the same function and utility as the Base Station specified for the South Hill Site would have provided had it been constructed. But Harris is not required to perform Work that would have been necessary for the South Hill to function as a Base Station, but that is not necessary for the Bayview Park Site to function as a base station.

c. Harris may commence construction related Work on the Bayview Park base station prior to completing the system design and receipt from SFMTA of final design approval. But should Harris do so, Harris shall be solely and entirely liable for any time and costs associated with or arising from any Additional Work, including but not limited to design and Stationary Equipment, that is required to re-perform or correct Work performed prior to SFMTA's approval of final design. Any Work necessary to construct and implement a base-station at the Bayview Park site, including Work arising from unexpected site conditions or constraints, except as otherwise expressly provided for under Contract Document 0700 Section 3.7, shall be Work included in the Contract Sum for which no additional compensation shall be owed or claimed.

7. Temporary Equipment Shelter at Forest Hill Base Station.

Harris shall provide a temporary equipment shelter at the Forest Hill base-station to ensure that new base station Stationary Equipment is protected from the weather and not accessible to the public during Stationary Equipment installation and System cut-over.

8. Standby MDT Boot-up for LRVs.

The MDT Requirements set out in Contract Document 000900 Appendix 12, Section 3.2 (commencing at page 109) are clarified as follows:

Every LRV shall be equipped with two MDTs, one in each end of the LRV. Harris represents that it's design will utilize existing LRV discrete input signals to determine which MDT will be set to "active," and Harris affirms that it has confirmed that solution is available and will work. In operation, these discrete input signals will trigger such that the MDT in the vehicle cab located at the lead or front end of the LRV shall be active. When the LRV reverses direction (that is, when the LRV train is routed on a return trip or is otherwise operated from the trailing cab) these discrete input signals will trigger such that, the MDT in the trailing cab shall become active. The inactive (trailing cab) MDT shall automatically boot-up and become fully functional within seven seconds of receipt of a train reverse signal consistent with the On-board MTMS equipment functional availability specification described in the Reliability Criteria section in Section 1.3.2 of Document 0900, Appendix 12. That is, the time to transfer Radio System functions from one end of a LRV train to the other end (i.e., any period in which text and radio communications are not available) shall not exceed seven seconds in duration consistent with the On-board MTMS equipment functional availability specification described in the Reliability Criteria section in Section 1.3.2 of Document 0900, Appendix 12.

9. Wheelchair Lift Request Display.

Harris shall add a wheelchair request circuit interface to the VLU and display wheelchair lift request message at the onboard passenger information display signs. The wheel chair request circuit interface shall function so that when a patron in a wheel chair pulls the stop request cord or pushes a stop request button on-board a vehicle, the VLU and passenger display signs will display a message that wheel chair lift service request has been requested for the next stop.

10. Farebox Interface.

Harris shall discontinue its efforts to integrate vehicle farebox functions to the Radio/CAD System. Requirements for the design and software implementation of communication interface to the onboard Farebox shall be eliminated from the Contract. Harris shall provide the physical J1708 cable from VLU to the farebox for SFMTA'S

future use, but the cable shall only be secured within the farebox but not connected to any component within the farebox.

11. Password Policy.

Harris recognizes that the application of password policy to Radio and CAD/AVL Systems in the use of active directory/ies so that the same password applies to all radio and CAD/AVL software applications is an important feature. If Harris and Xerox develop that feature as a commercially available product feature, it will be provided to the SFMTA for no additional charge.

12. Control Station to Dispatcher Workstation Interface.

Document 00900: Appendix 12 Section 2.6.2, Control Station Technical Features (commencing at page 50), is hereby modified as follows:

Delete the following two paragraphs in their entirety:

The interface between each control station and the SFMTA radio dispatcher workstation shall be provided by Harris.

For remote control, each workstation shall have the controls for its associated control station integrated into the Dispatch workstation via the centralized electronics equipment and shall operate in the same manner as any station.

13. Equipment Nameplates.

Document 00806: Identification Systems Products Section 2.1, Materials, Subsection C. Equipment Nameplates, is deleted in its entirety and replaced with the following:

C. Equipment Nameplates: Equipment nameplates shall be printed on a Metalized Polyester Material with white lettering on a black background. These labels shall be affixed with an adhesive to properly identify each piece of Stationary Equipment and Vehicle Equipment.

14. Radio Signal Testing - Radio Coverage Acceptance Tests.

Document 00900: Appendix 12 Section 7.9.4, Radio Coverage Acceptance Tests (commencing at page 217), is hereby modified as follows:

Delete the following paragraph in its entirety:

Testing shall be done in both talk-in and talk-out directions. Coverage requirements require that each direction pass the criteria specified, for each device specified (mobile and portable).

And replace that paragraph with the following:

DAQ testing shall be performed in both talk-in and talk-out directions. RSSI and BER testing shall be conducted for talk-out only. Coverage requirements require that each direction pass the criteria specified, for each device specified (mobile and portable).

15. Lenox Way Operation Control Center - System Installation and Cutover.

Document 00900: Appendix 12 Section 5.0, System Installation and Cutover, is hereby modified as follows:

The following paragraph is deleted in its entirety:

As part of this Design/Build project, the Lenox Way Operations Control Center theatre will be refurbished to accommodate the new dispatch consoles. In order to facilitate the renovation of the Lenox Way Operations Control Center, the existing Line Management Center at the SFMTA's One South Van Ness headquarters will be modified to accommodate rubber-tire vehicle dispatchers.

16. MTMS Data Failure Mode Radio Operation – On-Board Vehicle Failure.

Document 00900: Appendix 12 Section 1.11.8, On-board Vehicle Failure (commencing at page 20), is deleted in its entirety and replaced with the following:

1.11.8 ONBOARD VEHICLE FAILURE. In case of an onboard MTMS data communications failure, the system shall automatically save critical operating data (including time point arrival and departures times, passenger counts, and TSP requests) onboard for later upload to the central MTMS. The system shall operate in voice fallback mode. The onboard MTMS shall continue to attempt to re-establish data communications until successful. The voice fallback mode shall provide basic signaling functions to allow participation in trunked voice radio communications, including the signalization of Request to Talk (RTT), Priority Request to Talk (PRTI) and Emergency Alarm (EA) through the vehicle operator controls that are used in regular system operation. On the central side, the RTT, PRTT, and EA shall be displayed on the radio console. The fallback mode shall continue until MTMS re-establishes data communications.

Any failures that prevent the preceding conditions to be met shall result in the vehicle considered inoperable and vehicle availability compromised.

17. Remote MDT Logoff.

Document 00900: Appendix 12 Section 3.2.7, Textular and Tabular Displays (9th bullet, on page 118), is hereby modified as follows:

Remote vehicle operator logon or logoff by dispatchers and train controllers~~, with operator acknowledgement, if requested by the dispatcher or train controller~~.

18. Schedule and Assignment Activation.

Document 00900: Appendix 12 Section 3.2.13, Daily Schedules (commencing at page 121), is hereby modified as follows:

Future schedules ~~or assignments~~ shall automatically be activated based on a SFMTA defined future activation date. ~~Individual operating~~ All divisions shall ~~may~~ have schedule and assignment activation dates.~~s that are offset by several days. The MTMS shall accommodate selective activation of new schedule or assignment data by the SFMTA transit operating division.~~ Baseline vehicle and operator assignment data shall be retrieved daily and real-time changes shall be retrieved within 2 minutes.

19. Historic AVL Record Playback.

Document 00900: Appendix 12 Section 3.2.23, Historical Reporting (Playback) (on page 131), is hereby modified as follows:

Configurable speed of replay for moving forward through events as well as restarting at any specific time ~~location~~ of historical events.

20. Dashboard Query Printing.

Document 00900: Appendix 12 Section 3.2.25, Incident Management System (on page 133), is hereby modified as follows:

Users shall be able to print completed incident forms. Dashboard queries shall also be, interactively printable. The System shall provide report printing functions for single reports and for batch report printing at SFMTA designated intervals and times.

21. VLU Communication Protocols.

Document 00900: Appendix 12 Section 3.2, Base ITS Components (on page 107), is hereby modified as follows:

Overall, system interfaces whether provided by VLU or the MDT, shall include RS232, RS485 with busy line, ~~TIL,~~ SAE J1708, SAE J1939, USB, Ethernet,TCP/IP ~~TCPIIP,~~ discrete inputs and outputs, odometer, spare I/O ~~110~~ pins. audio inputs and outputs, ~~and full IDE capability for PC-type devices~~. The capability for automatic vehicle monitoring via J1708/CAN provided by the vehicle OEM shall be included as an option.

22. Forest Hill Base Station.

Document 00900: Appendix 12 Section 5.8.2, Preliminary Scope of Work, is hereby modified as follows:

The following sentence is deleted in its entirety:

> Install a City approved pre-action, dry stand pipe (FM-200 or equivalent) fire suppression system that is connected to the fire alarm system."

23. Wire and Cable Labeling and Marking.

a. Document 00800: Appendix 12 Section 5.14.1 General Installation Standards (on page 186), is hereby modified as follows:

Wire and cable shall be labeled every ~~6 inches~~ 24 inches. All wires shall be marked every 6 inches within 12 inches of the end of the wire.

b. Document 00900: Appendix 22 Section 22.17.5, Marking (on page 198) is hereby modified as follows:

"Identification of wires and terminals shall be ~~by white or yellow~~ legible permanent markers or ~~black~~printing. All wires shall be marked every 6 inches within 12 inches of the end of the wire and every 24~~12~~inches along the entire length of the wire. Wire markings ~~markers~~ shall be ~~stamped in two places, approximately 180 degrees apart, around the cylindrical portion,~~ readable along the axis of the conductor and should be consistently oriented for viewing throughout the vehicle and equipment to facilitate readability of the marking. Wires in multiple-conductor cables shall be color-coded."

24. Unforeseen Conditions and Asbestos Removal

a. Contract Document 000700, General Conditions, Section 3.7.5, Unforeseen or Differing Conditions, is modified as follows:

If the City determines, in its sole discretion, that the conditions reported materially so differ, or involve hazardous waste, an amount of asbestos remediation or other work as to cause a decrease or increase in Harris's scope of Work, the City will issue a Change Order, as provided in Article 6, herein, and/or a time extension as provided in Article 7, as appropriate.

b. Contract Document 000700 General Conditions, Section 3.7, Unforeseen or Differing Conditions, is modified to add the following:

3.7.8 Asbestos Removal.

a. The removal and remediation of asbestos under this Contract is limited to that ancillary to and necessary for Harris to install Stationary Equipment. Harris is not required to remediate asbestos from a site, except and only to the extent that Harris disturbs materials that contain asbestos in the course of installing Stationary Equipment or materials containing asbestos must be removed to allow Harris to install Stationary Equipment.

b. If Harris encounters asbestos when installing Stationary Equipment or if Harris finds materials containing asbestos during inspection of a site,

Harris shall notify the Engineer. Harris and the Engineer shall confer and jointly determine how best to proceed with the Work in a manner that will limit the disturbance of the asbestos, limit installation costs, and facilitate efficient installation of the equipment.

c. If the Engineer requires Harris to remove materials containing asbestos, Harris shall remove and dispose of those materials in a manner that will prevent the release of asbestos or make friable previously encapsulated asbestos. Harris shall seal or otherwise encapsulate any friable material that contains asbestos that Harris disturbs. Harris is not required to remediate asbestos where Harris has not disturbed material that contains it, except and limited to the extent that friable material containing asbestos prevents or impairs Harris' installation of Stationary Equipment.

d. Harris shall comply with all applicable Codes in performing any removal, handling, disposal, and sealing of materials containing asbestos.

e. Harris shall comply with any operating procedures or other requirements of the property owner, including but not limited to the site at One Market Plaza, for the performance of the Work at that site, including installation of Stationary Equipment and removal of materials containing asbestos and other construction debris.

f. The City shall compensate Harris for asbestos removal and mitigation (sealing) work under an allowance designated for that purpose. If asbestos removal and remediation at a site impacts the critical path of and delays the Work, and Harris is not able to reasonably mitigate that impact, the City shall extend the Contract Term for a period equal to each Day of unavoidable delay caused by asbestos removal or remediation ordered by the SFMTA.

25. HVAC at CRS and One Market Plaza.

Contract Document 000900 Appendix 12, Sections 5.7.5 and 5.9.5 are modified by the addition of the following paragraph:

Harris has amended the design of the HVAC systems at CRS and One Market Plaza transmission sites to provide for HVAC systems separate from those provided by the site owner. The SFMTA does not object to the changed design, but the SFMTA shall not compensate Harris for the installation or other costs related to the implementation of separate, additional HVAC systems at those locations.

26. SFMTA Support of Vehicle and Site Equipment Installation

A. Availability of SFMTA Resources.

The SFMTA will provide reasonable access to vehicles and personnel to support Vehicle Equipment and Facility Equipment installation. The SFMTA will support installation of Vehicle Equipment for a total of up to twelve vehicles per scheduled Day. The SFMTA will provide said support at no more than two facilities per scheduled Day. Harris shall not schedule Vehicle Equipment

installation at more than two vehicle maintenance facilities at any given time. The parties recognize that the proposed installation schedule is very aggressive. In the event that the SFMTA is unable to provide vehicles and personnel to support installation of Vehicle Equipment as provided , and such inability impacts the critical path of the Work, then the SFMTA shall extend the Contract Term for each day of delay to the Work arising from that unavailability. The SFMTA will exercise reasonable efforts to provide vehicles and personnel to support a more aggressive installation schedule, on the condition that Harris shall not bring and does waive any claim for delay to the Work that may arise from the SFMTA's inability to provide vehicles, personnel and site access greater than that specifically provided in this Contract Modification 12.

B. High Railer Vehicle.

As a courtesy and accommodation to assist Harris in the performance of Harris' Work, the SFMTA has provided Harris a High Railer Vehicle (HRV), which Harris has modified to meet its requirements for the Work. Harris personnel shall not operate the HRV. The SFMTA will provide Harris an operator to drive the HRV, who shall be a SFMTA employee. Only SFMTA staff may direct the HRV's operator. Neither Party shall be liable for delay to the Work arising from a breakdown of the HRV. The SFMTA shall have no liability for delay to the Work arising from the unavailability of a HRV operator, if the operator has not been scheduled at least 48 hours in advance of the Work. If a HRV operator is not available when scheduled and that unavailability impacts the critical path of the Work, the SFMTA shall extend the Contract Term for each day of delay to the Work arising from that unavailability of the operator, which shall be Harris's sole remedy for said delay. Said extension of the Contract Term shall be for time only; the SFMTA shall have no liability for Harris's extended overhead or other costs related to said delay.

27. Onboard IP addressing

Document 00900: Appendix 12 Section 3.2, Base ITS Components, Vehicle Logic Unit (VLU) (on page 108), is hereby modified as follows:

Means for the quick inspection of the operation of radio keyed, wireless, wireless bulk data transfer, software, proper voltage range, and ignition on shall be provided. Data storage capacity shall be sufficient to store at least five operating days of passenger counts and all event messages in the case of data communications disruption. Sufficient data storage capacity shall be installed to store two sets of complete current transit network, schedule and operator assignment data, pending route schedules, five days of operating data, and associated announcement files with 50% spare capacity for long-term growth. MTMS configuration settings related specifically to the vehicle shall be stored in the vehicle's configuration module installed in the vehicle such that the VLU unit can be swapped out and the unique vehicle information automatically associated with the replacement VLU. Each vehicle equipped with a VLU shall have a unique IP address for purposes of participating in the wireless bulk data transfer network, and for remote monitoring.

28. Obsolete Standard Replacement

Document 00900: Appendix 2 Section 2.28.1, Printed Circuit Board Standards, General (on page 62), is hereby modified as follows:

Circuit board material shall be per ~~MIL-P-13949~~ IPC-4101, latest revision, with a minimum thickness of 1/16-inch using type GB or GH base material. Type GE material may be used for boards which have no components whose power dissipation is greater than two watts and when said board is not mounted adjacent to components dissipating greater than two watts. The copper laminate shall be firmly attached to the board and shall be resistant to blistering and peeling when heated with a soldering iron.

H. Technical Clarifications.

Harris and the SFMTA have agreed to approximately 130 technical requirement clarifications, which Harris shall submit as a contract deliverable item (submittal) for SFMTA approval, and when so approved shall be covered by the terms of this Contract Modification in the same manner as other submittals the SFMTA approved prior to the Effective Date of this Contract Modification. In the event of any conflict between the Contract's design criteria and the technical requirement clarifications in said pending submittal, said technical requirements clarifications shall prevail, but only to the extent that the submittal does not alter System performance specifications.

I. All Other Contract Requirements Are Unchanged.

To the extent that any part, section, provision, or clause of the Contract is not specifically identified in this Contract Modification No. 12 as modified, amended, clarified or deleted, all other provisions and requirements of the Contract remain in full force and effect and all obligations of a party under said provisions (not specifically identified here as modified or deleted) are unchanged.

J. Included Appendices:

The following appendices are incorporated by reference to the body of the Contract as if fully set out therein:

A. Milestone Performance and Payment Table

B. Phase Capability List

[The remainder of this page is intentionally left blank.]

APPROVED:

As of the last date indicated below, the parties hereby approve this Contract Modification No. 12.

SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

_____
Edward D. Reiskin
Director of Transportation

Date: _____

HARRIS CORPORATION, operating by and through its RF Communications Division

By: _____

Date: _____

SFMTA Board of Directors

Resolution No. _____
Dated:_____

Attest:

_____
Secretary

Approved as to form:

Dennis J. Herrera
City Attorney

_____
Robert K. Stone
Deputy City Attorney
n:\ptc\as2015\1000386\01038874.doc

APPENDIX A

MILESTONE PERFORMANCE AND PAYMENT TABLE

The SFMTA shall compensate Harris for performance of the Work as provided in the following table.

Item			Method of Payment	Unit Price	Total	Comments
Phase 4.1	**Mod**	**Design Engineering Services**				
		Scope of Phase 4.1 - **Design engineering services** for the complete Multimodal Transit Management System (MTMS) and Public Service Voice Radio Network (PSVRN) and all other related components as described in Appendix 12 Technical Specifications.				
4.1.1a		**Project Mobilization**	MS	-	**$ 1,000,000.00**	PAID
4.1.1b-1		**Completion and conditional acceptance of Site Survey Lot #1 - 10 sites (such as Radio Sites, Facilities, underground and vehicles)**	MS	-	**$ 150,000.00**	PAID
4.1.1b-2		**Completion and conditional acceptance of Site Survey Lot #2 - 15 sites (such as Radio Sites, Facilities, underground and vehicles)**	MS	-	**$ 225,000.00**	PAID
4.1.1b-3		**Completion and conditional acceptance of Site Survey Lot #3 - 25 sites (such as Radio Sites, Facilities, underground and vehicles)**	MS	-	**$ 375,000.00**	PAID
4.1.1c		**Completion and conditional acceptance of Intermediate Design (65%)**	MS	-	**$ 2,841,803.00**	PAID
4.1.2a		**Completion and conditional acceptance of Contractor's Final Design Submission**	MS	-	**$ 1,000,000.00**	PAID
4.1.2b-1		**Completion and conditional acceptance of Final Design Approval Submission**	MS	-	**$ 1,538,874.00**	INVOICED
4.1.2b-2	**MOD 2**	**Completion of final design and conditional acceptance of nextbus interface**	MS		**$ 20,000.00**	INVOICED

Item			Method of Payment	Unit Price	Total	Comments
4.1.2b-15	**MOD 2**	**~~South Hill Tower Design~~ Bayview Park Tower Design**	-	-	**$ 20,000.00**	
4.1.2b-3	**MOD 4**	**Completion and conditional acceptance of Islais Creek final design**	MS		**$ 20,000.00**	INVOICED
4.1.2b-4	**MOD 4**	**Completion and conditional acceptance of Kirkland final design**	MS		**$ 20,000.00**	INVOICED
4.1.2b-5	**MOD 4**	**Completion and conditional acceptance of APC final design**	MS		**$ 10,000.00**	
4.1.2b-6	**MOD 4**	**Completion and conditional acceptance of Track Layout and turnaround final design**	MS		**$ 40,000.00**	
4.1.2b-7	**MOD 4**	**Completion and conditional acceptance of capture vehicle loading using real-time APC counts final design**	MS		**$ 4,000.00**	
4.1.2b-8	**MOD 4**	**Completion and conditional acceptance of Predictive subsystem and Web Services API final design**	LS		**$ 50,000.00**	INVOICED
4.1.2b-9	**MOD 9**	**Completion and conditional approval of design and construction documents for Tower 5 retrofit**	MS		**$ 20,955.00**	
4.1.2b-10	**MOD 10**	**Completion and conditional acceptance of Bayview Park Feasibility Study**	LS		**$ 111,584.00**	PAID
4.1.2b-11	**MOD 10**	**Completion and conditional approval of design and construction documents for BayView Park Design**	LS		**$ 188,327.00**	
4.1.2b-12	**MOD 11**	**Radio Tower Design**			**$ 3,125.00**	
4.1.2b-13	**MOD 11**	**Antenna Tower Retrofit Design**			**$ 6,608.00**	

Item			Method of Payment	Unit Price	Total	Comments
4.1.2b-14	**MOD 11**	**Completion and conditional approval of design and construction documents for Historics**	LS		**$ 230,000.00**	
		TOTAL PHASE 4.1			**$ 7,875,276.00**	
Phase 4.2		**System Development, Factory Testing, Site Construction**				
		Scope of Phase 4.2 - Development, customization, configuration, procurement of Stationary Equipment, and fabrication of materials for all equipment and software, and finalization of all test plans and procedures as described in the Design Criteria. Phase 4.2 shall also include construction at all communications sites (above and below ground), installation of in-building transmission lines, component testing, device testing, module testing, and factory acceptance testing of all subsystems.				
4.2.1-1		**Completion and conditional acceptance of Integrated System Test Plan, Test procedures and Cutover Plan for Phase 1 functionality**	MS	-	**$ 178,492.00**	

Item			Method of Payment	Unit Price	Total	Comments
4.2.1-2		**Completion and conditional acceptance of Integrated System Test Plan, Test procedures and Cutover Plan for Phase 2 functionality**	MS	-	**$ 178,492.00**	
4.2.2a		**Completion and conditional acceptance of Lot #1 Site Construction, at Twin Peaks (CRS), Forest Hill, Potrero and Flynn, ~~Bernal Heights~~**	MS	-	**$ 1,616,422.00**	
4.2.2b		**Completion and conditional acceptance of Lot #2 Site Construction, at Cable Car Barn, ~~Scott,~~ MME, Green and ~~South Hill~~ Bayview Park**	MS	-	**$ 1,332,569.00**	
4.2.2c		**Completion and conditional acceptance of Lot #3 Site Construction, at Presidio, Woods and One Market Plaza**	MS	-	**$ 1,116,979.00**	
4.2.2d		**Completion and conditional acceptance of Legacy Equipment Removal, Disposal and Site Clean up at Lenox Way, One Market Plaza, B of A at 555 California Street, Forest Hill, underground MUNI stations equipment room, Maintenance facilities and vehicles.**	MS	-	**$ 375,000.00**	
4.2.2e	**MOD 2**	**~~South Hill Tower~~ Bayview Tower Retrofit**	-	-	**$ 94,720.00**	
4.2.2f	**MOD 9**	**Tower 5 Retrofit**			**$ 206,479.00**	
4.2.2g	**MOD 4**	**Kirkland**			**$ 100,092.00**	

Item			Method of Payment	Unit Price	Total	Comments
4.2.2h	**MOD 4**	**Islais Ck**			**$ 100,092.00**	
4.2.3		**Construction Below Ground - Sites identified are typical. Payment will be made when quantity of sites per lot is completed. Actual names may vary**	MS	-		
4.2.3a		**Completion and conditional acceptance Lot #1 underground construction, at Embarcadero; Montgomery; Powell; Civic Center**	MS	-	**$ 950,000.00**	
4.2.3b		**Completion and conditional acceptance Lot #2 underground construction, at Van Ness; Church; Castro; Eureka**	MS	-	**$ 950,000.00**	
4.2.3c		**Completion and conditional acceptance Lot #3 construction, at Forest Hill; West Portal; East Portal; Carl Street Substation and Testing**	MS	-	**$ 1,239,084.00**	
4.2.4a-1		**Completion and acceptance of Phase 1 Factory Integration; which means staging is complete and integrated factory test is successfully complete**	MS	-	**$ 2,028,992.50**	**Includes credits for: monitors ($40,810), SW License ($72,999) and Fiber ($75,000). Completion criteria is based upon successful completion of Integrated FAT Phase 1.**

Item			Method of Payment	Unit Price	Total	Comments
4.2.4a-2		**Completion and acceptance of Phase 2 Integration; which means phase 2 upgrade is complete and integrated field test is successfully complete for Phase 2**			**$ 2,028,992.50**	**Successful field IFAT**
4.2.4b-1		**Completion of LMR Equipment Delivery to SFMTA and stored at storage facility**	MS	-	**$ 2,123,397.00**	
4.2.4b-2		**Completion of CAD/AVL Equipment Delivery to SFMTA and stored at storage facility following Phase 1 factory integration test.**			**$ 2,123,397.00**	
4.2.4c-1		**SFMTA's Conditional acceptance of the Mini- Fleet Phase 1 Test**	MS	-	**$ 4,156,163.50**	**Includes credit for logging recorder ($181,260)**
4.2.4c-2		**SFMTA's Conditional acceptance of the Phase 2 Mini- Fleet Test**	MS		**$ 4,156,164.00**	**Includes credit for logging recorder ($181,260)**
4.2.4d	**MOD 11**	**Equipment Delivery to SFMTA - Control Stations and stored at storage facility**			**$ 113,809.00**	
4.2.5a		**Successful completion and conditional acceptance of Acceptance Test - Radio System Test**	MS	-	**$ 375,523.00**	**Paid**
4.2.5b		**Successful completion and acceptance of Factory - BDA Tunnel Equipment Test**	MS	-	**$ 375,523.00**	

Item			Method of Payment	Unit Price	Total	Comments
4.2.5c-1		Successful completion and acceptance of Factory Acceptance Test - CAD/AVL Test (Phase 1 functionality)	MS	-	$ 187,761.50	CAD/AVL FAT was completed and successfully passed December 2014. $187,762 milestone to be paid upon successful completion of Phase 1 Integrated FAT milestone.
4.2.5c-2		Successful completion and acceptance of Factory Acceptance Test - CAD/AVL Test (Phase 2 functionality)			$ 187,761.50	CAD/AVL FAT was completed and successfully passed December 2014. $187,762 milestone to be paid upon successful completion of Phase 2 Field Integrated FAT milestone.
4.2.5.d-1		Successful completion and acceptance of Final Integrated FAT (Phase 1 functionality)			$ 500,000.00	Trigger Phase 1 payment 4.2.5c-1 of $187,762 for CAD/ AVL factory test conducted in December 2014
4.2.5.d-2		Successful completion and acceptance of Final Integrated FAT (Phase 2 functionality)	MS	-	$ 500,000.00	Trigger Phase 2 payment 4.2.5c-2 of $187,762 for CAD/ AVL factory test conducted in December 2014
		TOTAL PHASE 4.2			$ 27,295,905.50	

Item			Method of Payment	Unit Price	Total	Comments
Phase 4.3		**Equipment Installation, System Configuration and Training Program Planning**				
		Scope of Phase 4.3 - Delivery, installation, configuration, and testing of all Stationary Equipment at the SFMTA and City sites. The Training Plan shall be finalized, including the Draft Training Schedule, Draft Training Manuals, and Draft Training Agendas.				
4.3.1a-1		**Successful completion including testing of Lot #1: Microwave link to CRS, Potrero, Flynn, Cable Car Barn, ~~Scott,~~ Green, Presidio, MME and Woods**	MS	-	**$ 950,000.00**	**During Phase 1, pass site functional testing.**
4.3.1a-2		**Successful completion including testing of Lot #1: Microwave link to CRS, Potrero, Flynn, Cable Car Barn, ~~Scott,~~ Green, Presidio, MME and Woods**			**$ 950,000.00**	**During Phase 2, pass site functional testing.**
4.3.1b-1		**Successful completion including testing of Lot #2: Forest Hill, CRS and One Market Plaza**	MS	-	**$ 700,000.00**	**During Phase 1, pass site functional testing.**
4.3.1b-2		**Successful completion including testing of Lot #2: Forest Hill, CRS and One Market Plaza**			**$ 700,000.00**	**During Phase 2, pass site functional testing.**
4.3.1c-1		**Successful completion including testing of Lot #3: Lenox Way, 1455 Market Street and CAD/AVL Equipment Install**	MS	-	**$ 600,000.00**	**During Phase 1, pass site functional testing.**

Item			Method of Payment	Unit Price	Total	Comments
4.3.1c-2		Successful completion including testing of Lot #3: Lenox Way, 1455 Market Street and CAD/AVL Equipment Install			$ 600,000.00	During Phase 2, pass site functional testing.
4.3.1d-1		Successful completion including testing of Lot #4: Underground Equipment Install	MS	-	$ 180,410.00	Installation completion
4.3.1d-2		Successful completion including testing of Lot #4: Underground Equipment Install			$ 180,410.00	During Phase 2, pass site functional testing
4.3.1e-1		Successful completion including testing of Lot #5: Bayview Park Equipment Install			$ 180,410.00	During Phase 1, pass site functional testing.
4.3.1e-2		Successful completion including testing of Lot #5: Bayview Park Equipment Install			$ 180,410.00	During Phase 2, pass site functional testing.
4.3.2		Develop and Submit and acceptance of Training plan (Final)	MS	-	$ 75,654.00	
4.3.3		Develop and Submit Training Schedule (Draft)	MS	-	$ 75,654.00	
4.3.4		Develop and submit Training Manuals and Agendas (Draft)	MS	-	$ 130,843.00	
		TOTAL PHASE 4.3			$ 5,503,791.00	

Item			Method of Payment	Unit Price	Total	Comments
Phase 4.4		**Integrated System Testing**				
		Scope of Phase 4.4 - Includes the remainder of integrated system testing including but not limited to the Radio Coverage Acceptance Test, the Field Performance Test, and the Mini-Fleet Test as described in the Design Criteria for the Project. Phase 4.4 shall also include finalization of all training documentation as described in the Design Criteria.				
4.4.1		**Successful completion of Radio Coverage Acceptance Test and submit Report**	MS	-	**$ 878,780.00**	
4.4.2-1		**Successful completion of Field Performance Test and submit Report for Phase 1 functionality**	MS	-	**$ 456,512.00**	
4.4.2-2		**Successful completion of Field Performance Test and submit Report for Phase 2 functionality**			**$ 456,512.00**	
4.4.3a-1		**Successful completion of Mini-Fleet Test and submit Report for Phase 1 functionality**	MS	-	**$ 173,606.00**	
4.4.3a-2		**Successful completion of Mini-Fleet Test and submit Report for Phase 2 functionality**			**$ 173,606.00**	
4.4.3b	**MOD 2**	**Successful completion of Mini-Fleet Test and submit report - NextBus**			**$ 27,582.00**	**Phase 2 acceptance due to subway solution**

Item			Method of Payment	Unit Price	Total	Comments
4.4.3c	MOD 4	Successful completion of Mini-Fleet Test and submit report - APC			$ 89,597.00	
4.4.3d	MOD 4	Successful completion of Mini-Fleet Test and submit report - Track Layout and Turnaround Layer			$ 152,891.35	
4.4.3e	MOD 4	Successful completion of Mini-Fleet Test and submit report - Capture Vehicle Load using APC			$ 10,361.00	
4.4.3f	MOD 4	Successful completion of Mini-Fleet Test and submit report - Predictive Subsystem			$ 104,313.08	
4.4.3g~~f~~	MOD 11	Successful completion of Mini-Fleet Test and submit report - Clear Call			$ 89,384.00	
4.4.3h~~g~~	MOD 11	First of Kind Install & Test - Historics			$ 172,500.00	
4.4.4		Development and Submittal Training Schedule (Final)	MS	-	$ 14,121.00	Phase 2 due to LRV late schedule
4.4.5-1		Development and Submittal Training Manuals and Agendas (Final), Phase 1	MS	-	$ 56,480.50	
4.4.5-2		Development and Submittal Training Manuals and Agendas (Final), Phase 2			$ 56,480.50	
4.4.6		Database Dictionary and User Manuals	MS	-	$ 42,364.00	
		TOTAL PHASE 4.4			$ 2,955,090.43	

Item			Method of Payment	Unit Price	Total	Comments
Phase 4.5		**Training, System Cutover and Availability Demonstration**				
		Scope of Phase 4.5 - Includes but is not limited to training of SFMTA staff, installation of mobile equipment on SFMTA's fleet of revenue and non-revenue vehicles, and distribution of portable equipment. Phase 4.5 shall also include delivery of all as-built versions of maintenance manuals and as-built system documentation. Phase 4.5 shall conclude with the System Availability Test and submittal of the test report.				
4.5.1		**Completion and conditional acceptance of the training Program**	MS	-	**$ 1,029,786.00**	
4.5.2		**Installation and conditional acceptance of Mobile Equipment in all revenue and non revenue vehicles**	Unit Price			
4.5.2a		***Configuration A mobile radio***	**100**	**$ 4,991.94**	**$ 499,194.00**	
4.5.2b	**CM 8**	***Configuration B mobile radio***	**140**	**$ 6,053.68**	**$ 847,515.20**	
4.5.2d1		***Diesel Hybrid Electric, Orion, 30-foot. (Delivery)***	**35**	**$ 23,244.43**	**$ 406,777.53**	
4.5.2d2		***Diesel Hybrid Electric, Orion, 30-foot. (Phase 1 Complete)***	**35**	**$ 23,244.43**	**$ 203,388.76**	
4.5.2d3		***Diesel Hybrid Electric, Orion, 30-foot. (Phase 2 Upgrade Complete)***	**35**	**$ 23,244.43**	**$ 203,388.76**	

Item			Method of Payment	Unit Price	Total	Comments
4.5.2e1		*Diesel Hybrid Electric, Orion, 40-foot (Delivery)*	65	$ 23,244.43	$ 755,443.98	
4.5.2e2		*Diesel Hybrid Electric, Orion, 40-foot (Phase 1 Complete)*	65	$ 23,244.43	$ 377,721.99	
4.5.2e3		*Diesel Hybrid Electric, Orion, 40-foot.(Phase 2 Upgrade Complete)*	65	$ 23,244.43	$ 377,721.99	
4.5.2f1	CM 8	*Diesel, NABI, 40-foot (Delivery)*	16	$ 23,244.43	$ 185,955.44	
4.5.2f2	CM 8	*Diesel, NABI, 40-foot (Phase 1 Complete)*	16	$ 23,244.43	$ 92,977.72	
4.5.2f3	CM 8	*Diesel, NABI, 40-foot (Phase 2 Upgrade Complete)*	16	$ 23,244.43	$ 92,977.72	
4.5.2g1		*Diesel, Neoplan, 40-foot (Delivery)*	225	$ 23,244.43	$ 2,614,998.38	
4.5.2g2		*Diesel, Neoplan, 40-foot (Phase 1 Complete)*	225	$ 23,244.43	$ 1,307,499.19	
4.5.2g3		*Diesel, Neoplan, 40-foot (Phase 2 Upgrade Complete)*	225	$ 23,244.43	$ 1,307,499.19	
4.5.2h1		*Diesel, Neoplan, 60-foot (Delivery)*	150	$ 23,281.93	$ 1,746,144.75	
4.5.2h2		*Diesel, Neoplan, 60-foot (Phase 1 Complete)*	150	$ 23,281.93	$ 873,072.38	
4.5.2h3		*Diesel, Neoplan, 60-foot (Phase 2 Upgrade Complete)*	150	$ 23,281.93	$ 873,072.38	
4.5.2k1		*ETI, 40-foot (Delivery)*	275	$ 23,454.43	$ 3,224,984.13	
4.5.2k2		*ETI, 40-foot (Phase 1 Complete)*	275	$ 23,454.43	$ 1,612,492.06	
4.5.2k3		*ETI, 40-foot (Phase 2 Upgrade Complete)*	275	$ 23,454.43	$ 1,612,492.06	
4.5.2l1		*ETI, 60-foot (Delivery)*	45	$ 23,454.43	$ 527,724.68	
4.5.2l2		*ETI, 60-foot (Phase 1 Complete)*	45	$ 23,454.43	$ 263,862.34	
4.5.2l3		*ETI, 60-foot (Phase 2 Upgrade Complete)*	45	$ 23,454.43	$ 263,862.34	
4.5.2m1	CM 8	*NewFlyer, 60-foot (Delivery)*	28	$ 23,454.43	$ 328,362.02	
4.5.2m2	CM 8	*NewFlyer, 60-foot (Phase 1 Complete)*	28	$ 23,454.43	$ 164,181.01	

Item			Method of Payment	Unit Price	Total	Comments
4.5.2m3	CM 8	*NewFlyer, 60-foot (Phase 2 Upgrade Complete)*	28	$ 23,454.43	$ 164,181.01	
4.5.2n		*Breda Light Rail Vehicles*	160	$ 30,582.67	$ 4,893,227.20	
4.5.2o		*Light Rail Vehicle Digital Visual and Announcement System*	160	$ 10,961.83	$ 1,753,892.80	
4.5.2p	CM 11	*St. Louis Car, SEPTA PCC Style*	0	$ 6,128.68	-	
4.5.2q	CM 11	*Double-Ended PCC Style*	0	$ 7,403.56	-	
4.5.2r	CM 11	*Muni PCC 1 (1040) Style*	0	$ 6,128.68	-	
4.5.2s	CM 11	*St. Louis Car, NJT Newark PCC Style*	0	$ 6,128.68	-	
4.5.2t	CM 11	*Fiat/Breda, Milan PW Style*	0	$ 6,128.68	-	
4.5.2u		*Vintage Style*	15	$ 6,128.68	$ 91,930.20	
4.5.2v		*Powell Street Style*	35	$ 2,205.72	$ 77,200.20	
4.5.2w		*California Street Style*	15	$ 2,205.72	$ 33,085.80	
4.5.2x		*Cubic Farebox Interface to MTMS*	1055	616.11	$ 650,000.27	paid per bus installation
4.5.2.y-1	MOD 8	*Diesel Hybrid New Flyer (Delivery)*	112	$ 23,454.43	$ 1,313,448.00	
4.5.2.y-2	MOD 8	*Diesel Hybrid New Flyer (Phase 1)*			$ 656,724.00	
4.5.2.y-3	MOD 8	*Diesel Hybrid New Flyer (Phase 2 Upgrade Complete)*			$ 656,724.00	
4.5.2.y	MOD 11	*Historic Fleet Installation*	43	$ 26,089.32	$ 1,121,840.76	
4.5.3		Configuration and distribution of all Portable Equipment	Unit Price			
4.5.3a		*Portable Tier I P25 - XG 75*	525	$ 2,701.28	$ 1,418,172.00	
4.5.3b		*Portable Tier II P25*	30	$ 2,701.28	$ 81,038.00	
4.5.3c		*Portable Tier III P25*	20	$ 2,872.16	$ 57,443.00	
4.5.4		All As Built H/W Documentation , S/W Documentation & Maint. Manuals	LS	-	$ 1,769,267.00	

Item			Method of Payment	Unit Price	Total	Comments
4.5.5		**Deliv. Of all Program Source Code;execution of S/W Escrow Agreement**	LS	-	**$ 772,284.00**	
4.5.6		**System Availability Test Report and Punchlist Items**	MS	-	**$ 2,660,322.00**	
		TOTAL PHASE 4.5			**$ 39,963,876.20**	
		Two years of Warranty Support for MTMS and PSVRN				
W1		**Completion of First Quarter of First Year Warranty**	LS	-	**$ 242,914.00**	
W2		**Completion of Second Quarter of First Year Warranty**	LS	-	**$ 242,914.00**	
W3		**Completion of Third Quarter of First Year Warranty**	LS	-	**$ 242,914.00**	
W4		**Completion of Fourth Quarter of First Year Warranty**	LS	-	**$ 242,914.00**	
W5		**First Quarter of Second Year Warranty**	LS	-	**$ 242,914.00**	
W6		**Completion of Second Quarter of Second Year Warranty**	LS	-	**$ 242,914.00**	
W7		**Completion of Third Quarter of Second Year Warranty**	LS	-	**$ 242,914.00**	
W8		**Completion of Fourth Quarter of Second Year Warranty**	LS	-	**$ 242,914.00**	
		3 YEAR EXTENDED SUPPORT PROGRAM				
W8	**MOD 7**	**3 year of extended support program**			**$ 3,491,447.23**	**equally split into quarterly payment, paid at the end of each quarter.**
		~~**1st Year Support Program**~~			~~**$ 1,112,146.86**~~	
		~~**2nd Year Support Program**~~			~~**$ 1,163,030.44**~~	
		~~**3rd Year Support Program**~~			~~**$ 1,216,269.93**~~	

Item			Method of Payment	Unit Price	Total	Comments
		TOTAL WARRANTY			**$ 5,434,759.23**	
O33a , b & c	**CM 001**	**TSP services**			**$ 850,631.00**	**TSP termination settlement at $593,766.00.**
		Delivery and Conditional acceptance of Base Spare Parts			**$ 896,313.00**	
		Allowance			**$ 925,000.00**	
TOTAL SFMTA PROJECT					**$ 91,700,642.21**	

Payment for Vehicle Installations

The City will compensate Harris for completion of vehicle equipment installations as stated herein and in the Vehicle Installation Schedule. The values stated in this Milestone Performance and Payment Table for vehicle equipment installation are based on the following percentages of values stated in the original Project Milestone Schedule: 50 percent of the value of each Phase 1 vehicle installation will be paid following installation of the Equipment to a vehicle; 25 percent of the value of each vehicle installation made in Phase 1 will be paid upon Substantial Completion of Phase 1; the remaining 25 percent of the value of each vehicle installation performed in Phase 1 will be paid upon Substantial Completion of Phase 2. Percentage payment retention provided in Document 00700, General Conditions, Section 9.4, shall apply to all progress payments. The dollar values for any type of vehicle will be paid using the percentage values shown in the following chart:

Vehicle Type and Phase		Install Payment per Vehicle unit price	Completion of Phase Payment per vehicle unit price	Substantial Completion Payment per vehicle unit price
Rubber tire Bus (Phase 1) (Payment items 4.5.2d, e, f, g, h, k, l, m, and y.)		(50%)	(25%)	(25%)
Cable Cars (Phase 1) (payment items 4.2.5v and w)		100%	N/A	
Non-revenue vehicle (payment items 4.5.2a and b)		100%	N/A	
LRV (Phase 2) (payment items 4.5.2n and o)		100%	N/A	
Historic Rail (Phase 2) (Items 4.5.2p, q, r, s, t, u, and z.)		100%	N/A	

APPENDIX B

PHASE CAPABILITY LIST

Item ID	Capability	Capability Description	Phase	CAD/ AVL FAT	PH1 IFAT	PH1 FPAT	PH1 MFT	PH2 IFAT	PH2 FPAT	PH2 MFT	Punch list	Operational impact during Phase 1	Impact to Phase 1 training
1	Computer Aided Dispatch (CAD)	Capability for dispatching mass transit vehicles assisted by computer along with integration with OpenSky Radio System.	1	X	X	X	X					N/A	None
2	Automated Vehicle Location (AVL)	Capability that enables viewing vehicle locations and tracking them on a map.	1	X	X	X	X					N/A	None
3	Enhanced Automated Vehicle Location (AVL) on-board capability	Enhanced incorporation of Gyroscope	1				X						
4	Voice Call Processing & Management	Capability that enables conducting voice calls between fixed end (CAD) and vehicles.	1	X	X	X	X					N/A	None
5	Service (Data) Messaging	Capability that enables conducting data messages between fixed end (CAD) and vehicles.	1	X	X	X	X					N/A	None
6	Emergency Alarm Processing - VLU equipped vehicles	Capability that notifies fixed end of emergency conditions on board a VLU equipped vehicle along with covert monitoring.	1	X	X	X	X					N/A	None
7	Rapid Emergency Alarm Reporting (15 sec) - Non-VLU equipped vehicles	Capability that notifies fixed end of emergency conditions on board a non-VLU equipped vehicle along with covert monitoring.	2					X	X	X		EA polling will be conducted at 60 seconds interval for vehicles that are not equipped with a VLU.	None
8	Communications History	Capability that enables viewing history of voice calls and service messaging.	1	X	X	X	X					N/A	None
9	Incident Management	Capability that enables documenting incidents and viewing them based on priority per SFMTA defined user work assignments.	1	X	X	X	X					N/A	None
10	Incident History	Capability that enables CAD viewing incident history based on CAD user specified filters	1	X	X	X	X					N/A	None
11	Electronic Incident Forms	Capability that allows SFMTA to create/define incident forms.	1	X	X	X	X					N/A	None
12	View Schedule Data	Capability that allows to display block and paddle	1	X	X	X	X					N/A	None
13	Schedule Data Adjustments	Capability that enables CAD user the following schedule adjustments a) Create Extra Work b) Schedule Modifications c) Add/Cancel Trips d) Schedule Delta	1	X	X	X	X					N/A	None
14	OrbCAD Specials	Capability that allows creation of a block of services outside of the schedule	1	X	X	X	X					N/A	None

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15	Detour Management	Capability that enables the CAD system to automatically notify vehicles based on user specified start/stop dates/times and routes. CAD user can specify detour messages to operators (excludes Bus Bridge/Ad Hoc Detours).	1	X	X	X	X					N/A	None
16	Early Turnback	Capability that allows detection of authorized vs. unauthorized early turnback	1	X	X	X	X					N/A	None
17	Playback	Capability that allows playback of historical data.	1	X	X	X	X					N/A	None
18	Pull-in/Pull-Out/Relief Monitoring	Monitoring and CAD displays showing on-time and late performance.	1	X	X	X	X					N/A	None
19	Headway Monitoring	Capability that enables dispatcher to view graphical headway between vehicles. CAD system provides alerts for bunching.	1	X	X	X	X					N/A	None
20	Service Summary	Capability that enables viewing of how a set of buses are collectively operating on user selected routes.	1	X	X	X	X					N/A	None
21	511.org Traveler Information	Traveler information feed to 511.org	1	X	X	X	X					N/A	None
22	NextBus Traveler Information	Traveler information feed to NextBus	1	X	X	X	X					N/A	None
23	Report Management (Crystal Reports)	Capability that allows users to view historical data	1	X	X	X	X					N/A	None
24	Route and Schedule Adherence	Capability that enables VLU to compute vehicle performance against the schedule. Early/Late/Normal performance status presented to both dispatcher as well as to the operators.	1	X	X	X	X					N/A	None
25	Automatic Passenger Counter (APC) (Mod 11)	Capability that allows for processing and collection of passenger counts onboard a vehicle.	1				X					N/A	None
26	Paddle Display	Capability that allows operators to view paddle on the MDT.	1	X	X	X	X					N/A	None
27	Wireless Bulk Data Transfer (WBDT)	Capability that allows upload and download of vehicle data.	1	X	X	X	X					N/A	None
28	DVAS	On-board traveler Information (voice annunciation and signage).	1	X	X	X	X					N/A	None
29	Alternating Signs - Custom SFMTA automatic onboard traveler information system prioritization and interleaving, and lift request incorporation	Customized On-board Traveler Information (priority and interleaving) capability	1				X					N/A	None

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30	Local failover for Fixed End	Allows for a local failover for fixed end servers in the event of a failure.	1	X	X	X	X					N/A	None
31	Run Sign Control	Capability that allows for updating number on run sings	1	X	X	X	X					N/A	None
32	Map Maintenance	A tool that assists administrators with creating and editing necessary data to provide the GIS related functionality employed within the OrbCAD system.	1	X	X	X	X					N/A	None
33	Context Sensitive Help	Feature that provides help to the operator on the MDT on how to use a particular function/feature.	1	X	X	X	X					N/A	None
34	Wheelchair Status Display	Feature that provides notification to both operator and dispatch if wheelchair has been cycled or not.	2					X	X	X		During Phase 1, there will be no Wheelchair not cycled warning message to the operator or to dispatch in Phase 1.	Using Incident Management training from Phase 1, Dispatcher will be informed that Wheelchair cycle notification is a newly available incident.
35	LRV solution	CAD & vehicle capabilities specifically designed for supporting LRV operations (e.g. consist management, train sequencing, translite interface, cab-to-cab communications, ATCS, etc.)	2					X	X	X		Not applicable to Rubber Tire Vehicles deployed during Phase 1. Solution only impacts LRVs which is limited to Phase 2.	New capability provided in Phase 2 Training only.
36	Display on the MDT to replicate the DRI ODK sign field entry	Capability to display on the MDT to replicate the DRI ODK sign field entry	2					X	X	X		During Phase 1, the vehicle operator will use existing DRI ODK device to manually enter in head sign codes. During Phase 2 the vehicle operator will be able to enter codes manually into the MDT	
~~37~~	~~Cubic Farebox & Single Point Logon~~	~~Capability that allows the VLU to communicate with the Cubic farebox using a J1708 interface while allowing MDT to serve as a single point of operator logon~~	~~1~~				~~X~~					~~N/A~~	~~None~~
38	Voice Fallback - Open Voice	Capability that during voice fall back scenario where the on-board VLU has lost connectivity to the DCC, on-board communications will operate in an "open microphone" mode	1	X	X	X	X						

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39	Voice Fallback - with integrated RTT, PRTT, EA on the MDT	Capability that enables conducting voice calls between fixed end (CAD) and vehicles in fallback.	1		X	X	X					Voice Fallback Capability exists for phase 1. During fallback operators will be in "open microphone" mode where an RTT, PRTT or EA is not required.	Communication to operators advising them to start using already familiar RTT, PRTT & EA when in voice fallback mode as well. Operators will be trained on this behavior during phase 1 for normal operations and will be informed to use already familiar RTT, PRTT, & EA while in voice fallback.
40	Trapeze OPS interface	Interface that allows for bidirectional exchange of operator and vehicle assignment data between Trapeze & CAD.	1				X					Prior to fielding of Phase 2 software, operators will be required to enter their "block" number on the MDT at logon.	No new training required; Communication to operators advising them that at logon "block" number is optional.
41	Ad Hoc Detours/Bus Bridge - Phase 1 has capability to manage detours and bus bridges but won't have the rubberband capability communicated to the vehicle until Phase 1. Work-around would be to change the "off-route" distance.	Capability allows users to draw rubberband on the system to identify geographical area for the detour.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	New capability provided in Phase 2 Training only.
42	NTP System Time	Capability allows provisioning of system time to network devices on-board a vehicle.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	None. No user interaction.
43	GPS Port Server	Capability allows provisioning of GPS position to network devices on-board a vehicle.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	None. No user interaction.
44	GPS via RS232 (PCO)	Capability allows provisioning of GPS position to network devices on-board a vehicle using RS232 for specific connectivity to the existing SFMTA DVR.	1				X					N/A	None. No user interaction.

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45	Equipment Status Monitoring	Capability that provides equipment status and supports in maintenance of MTMS on-board systems.	1/2	X	X	X	X	X	X	X		Partial feature exists in Phase 1. Following status be monitored during Phase 1 • Communications Status • GPS • Odometer/Speed Sensor • MDT • VLU/MDT Software Versions • On-Board Data Versions • Passenger Status/Counts • Radio Keyed Status • Ignition Status • Voltage Status At Phase 2, the following additional items will be included: • Radio Status • Twin Vision Signs Status • Sunrise Interior Signs Status • Translite Signs and Keypad Controller Status • Echelon SLTAs Status • Cisco Mobile Router Status • Cohda OBU Status • Discrete Signals • WBDT Status ~~• Farebox~~	Incorporated in Phase 1 and Phase 2 Maintenance Training.
46	Selective Messaging	Capability that allows administrators to prevent operators or dispatchers from sending service messages	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	New capability provided in Phase 2 Training only.
47	AVA activate w/o reboot	Capability allows AVA image to be updated, based upon activation date, without requiring a power cycle.	2					X	X	X		During Phase 1, if SFMTA decides to change the AVA image, it will require a reboot of the IVU for vehicles that do not power off at the end of service day (limited to Electronic Trolleys only)	None. No user interaction.
48	Transfer Request - dispatcher can issue a transfer request today. If the schedule data includes a transfer, we can demonstrate current capability in the Field, Phase 1.	Feature allows a bus operator on behalf of a passenger to request a transfer to an alternate route.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	New capability provided in Phase 2 Training only.

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49	MDT Canned Message Tool - Phase 2 is the ability to administratively create a new canned MDT message (including reordering) from the vehicle.	A tool specifically designed to allow configuration of services messages for the OrbStar.	2					X	X	X		Prior to fielding of Phase 2 software, SFMTA would need to work with Xerox to update service messages.	New capability provided in Phase 2 Training only.
50	Preplanned Events	A feature that allows configuration management of pre-planned special events.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	New capability provided in Phase 2 Training only.
51	Track Layout - For Phase 1, dispatchers could use the pre-existing data software for catenary on the SCADA page. Likely will continue to be used during Phase 2 for greater detail.	Capability that allows SFMTA to add/delete/modify track layout while also displaying track layout on the AVL map.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	New capability provided in Phase 2 Training only.
52	Web API (GTFS)	Real-time General Transit Feed Specification (GTFS) Web Services API.	2					X	X	X		Stand alone feature with no impact to existing phase 1 operations	None. No user interaction.
53	Geographic DCC redundancy - During Phase 1, outbound messages (DCC to vehicle) on the DCC will be lost during failover. Failover will be automated. During Phase 2, outbound messages on the DCC, will be synchronized to the hot-standby DCC, and these messages will not lost during failover.	Hot standby capability for the DCC servers allows syncing of outbound messages between the geographically separated DCC servers.	2					X	X	X		During phase 1, Window of time during Phase 1 (will be about 30 seconds). Can instruct operators to be aware of any major failure messages associated with the DCC and be cognizant of the window of time. Vehicle will retry until it delivers.	None. No user interaction.

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54	Clear Call (Mod 11) - If the operator does not hang up the handset, the call will hold up to 60 seconds (configured), the call will remain active until 60 seconds	Assuming a Dispatcher / Controller has established a voice call with an individual or a group of vehicles, and the Dispatcher/Controller selects the “Clear Call” button on the Voice Call GUI, the CAD System will send a message via the OpenSky Radio System to the set of target vehicles. Upon receipt of the message from the CAD system, each VLU will terminate the voice call. Further, this message will trigger the VLU to send a message to the MDT to appropriately update the Operator Action portion of the display.	2					X	X	X		During Phase 1, the voice call would not be terminated on the vehicle until a dispatch configured timeout has been reached.	
55	Historics with VLU (Mod 11)		2					X	X	X			
56	MDT Warm Standby for LRV	Capability for a warm-standby solution to be available for the LRV dual ended MDT allowing for 7 second transfer from "active" MDT to "inactive" MDT	2							X		No LRVs deployed in Phase 1. Capability will exist in time for deployment.	New capability provided in Phase 2 Training only.
57	Off route Notification "stop" display	Capability for off route notification to include the name of the last known stop (requirement ID 2545)	2					X	X	X		During Phase 1, the off route notification will include the name of the last known "timepoint" instead of the last known "stop". This will be upgraded in the Phase 2 deployment	User will have further granularity with the deployment of the Phase 2 capability. Memo can be sent to the dispatchers to communicate the update.
58	Historical Playback "Fleet" Selection	Capability for a dispatcher to select "fleet" as an option for historical playback (requirement ID 2689)	2					X	X	X		During Phase 1, the Historical Playback tool will allow selection by vehicle(s), vehicle operator(s), route(s), blocks or train(s) or run(s) for specific time frames through a query action window	New capability will be provided in Phase 2. Capability can be described in a memo notice to the dispatchers
59	Wireless Sign Database Update Capability (ALL-LED Signs)	Functionality that will allow the SFMTA to perform a sign database “deployment” to the on-board TwinVision signs via Wireless Bulk Data Transfer functionality (“Wireless Update”). For the older All-LED TwinVision signs	2					X	X	X			
60	Wireless Sign Database Update Capability (SmartSeries 2 Signs)	Functionality that will allow the SFMTA to perform a sign database “deployment” to the on-board TwinVision signs via Wireless Bulk Data Transfer functionality (“Wireless Update”). For the newer TwinVision SmartSeries 2 sign	Final Acceptance								X	Sign data base updates will be handled manually per the existing SFMTA process prior to the availability of this feature.	

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61	Active Directory Integration	OrbCAD Application Active Directory Integration to be demonstrated prior to Final Acceptance	Final Acceptance								X	OrbCAD application will handle password verification and management separate from the Active Directory During Phase 1.	New capability will be provided in Phase 2. Capability can be described in a memo notice to the dispatchers
62	Configurability of Vehicle Icons	Vehicle icons customization.	2					X	X	X		During Phase 1, the vehicle icon customization is limited.	New capability will be provided in Phase 2. Capability can be described in a memo notice to the dispatchers

Test legend:

CAD/AVL FAT	CAD/AVL Factory Acceptance Test
IFAT	Integrated Factory Acceptance Test
FPAT	Field Performance Acceptance Test
MFT	Mini Fleet Test