

THIS PRINT COVERS CALENDAR ITEM NO.: 6.3

**SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY**

DIVISION: Finance and Information Technology

BRIEF DESCRIPTION:

To approve Contract No. SFMTA-2025-11-LOC with Conduent Inc. (Conduent) for software design and implementation services to upgrade the Computer Aided Dispatch and Automatic Vehicle Location system (CAD/AVL Software Upgrade Bundle Project), for a contract amount not to exceed \$3,497,000 and a term of four years.

SUMMARY:



- As part of the Radio System Replacement Project Design Build Services, Contract 1240, Conduent designed and implemented a Computer Assisted Dispatch/Automatic Vehicle Location (CAD/AVL) system. The CAD/AVL System was put into service in November 2016.
- The CAD/AVL system is used by SFMTA Transit Division (Muni) managers for real-time management of transit service, transit performance monitoring, and for communication with vehicle operators.
- The CAD/AVL Software Upgrade Bundle Project will implement reliable and secure fixed-end IT infrastructure, migrate data communications to the cellular network, provide better features to manage service changes, and improve the ability to manage headway-based service.
- Due to the proprietary nature of the Services required to perform upgrades to the existing CAD/AVL System, these services are only available from Conduent, and were procured in accordance with sole source requirements set out in the San Francisco Administrative Code.
- There is no Local Business Enterprise (LBE) subcontracting participation requirement for this Contract.

ENCLOSURES:

1. SFMTAB Resolution
2. SFMTA Contract No. 2025-11-LOC

APPROVALS:

DATE

| | | |
|-----------|---|------------------|
| DIRECTOR |  | October 30, 2024 |
| SECRETARY |  | October 30, 2024 |

ASSIGNED SFMTAB CALENDAR DATE: November 6, 2024

PURPOSE

To approve Contract No. SFMTA-2025-11-LOC with Conduent Inc. (Conduent) for software design and implementation services to upgrade the Computer Aided Dispatch and Automatic Vehicle Location system (CAD/AVL Software Upgrade Bundle Project), for a contract amount not to exceed \$3,497,000 and a term of four years.

STRATEGIC PLAN GOALS AND TRANSIT-FIRST POLICY PRINCIPLES

This item supports the following Strategic Plan Goals:

Goal 4: Make streets safer for everyone.

Goal 5: Deliver reliable and equitable transportation services

Goal 9: Fix things before they break, and modernize systems and infrastructure

Transit-First Policy:

1. To ensure quality of life and economic health in San Francisco, the primary objective of the transportation system must be the safe and efficient movement of people and goods.

2. Transit priority improvements, such as designated transit lanes and streets and improved signalization, shall be made to expedite the movement of public transit vehicles (including taxis and vanpools) and to improve pedestrian safety.

DESCRIPTION

In March 29, 2012, SFMTA Board of Directors approved Contract No. 1240, Radio System Replacement Project Design Build Services with L3Harris, Inc. The scope included implementation of a CAD/AVL system by Conduent. The CAD/AVL system was designed to communicate voice and data over the L3Harris radio system.

The CAD/AVL system is used by SFMTA Transit Division (Muni) managers for real-time management of transit service, transit performance monitoring, for communication with vehicle operators, and the CAD/AVL system generates data necessary for accurate customer vehicle predictions.

The CAD/AVL system is comprised of proprietary hardware and software that is installed on revenue vehicles and on fixed-end servers.

The CAD/AVL Software Upgrade Bundle Project will implement reliable and secure fixed-end IT infrastructure; migrate data communications to the cellular network; provide better features to manage service changes; and improve the ability to manage headway-based service. Maintenance and warranty services for the upgrades will be provided under the recently approved contract with Conduent, CAD/AVL System Maintenance and Support Services, Contract SFMTA-2024-11.

Due to the proprietary nature of Conduent products implemented at the SFMTA, services necessary for upgrades to the CAD/AVL system are only available from Conduent, and were procured in accordance with sole source requirements set out in San Francisco Administrative Code Sections 21.5(b) (sole source), 21.5(d) (proprietary articles) and 21.30 (software and associated professional services exemptions). Staff performed an independent analysis of level of effort and price of the services to be delivered and determined that the proposed contract price is fair and reasonable.

There is no Local Business Enterprise (LBE) subcontracting participation requirement for this Contract.

Pursuant to the Policy of the Civil Service Commission (“Commission”) on Personal Service Contracts, this Contract is exempt from Commission review since it is a contract “for repair, maintenance, or similar services related to the purchase of software and equipment that must be performed by the manufacturer such as, for example, where such services cannot be completed by City employees without voiding the warranty.”

PUBLIC OUTREACH AND STAKEHOLDER ENGAGEMENT

To develop requirements and scope for this Contract, project staff consulted key stakeholders from Transit and IT (Information Technology).

Public outreach was not necessary as this Contract is software and hardware enhancements that are proprietary products and services of Conduent, which will improve SFMTA operations, and will not have an impact on the environment.

ALTERNATIVES CONSIDERED

The alternatives to issuing Contract No. SFMTA-2025-11-LOC would be for the SFMTA to:

1. Issue an open bid for a new CAD/AVL system. This option would require discarding the existing infrastructure on vehicles, which could lead to greater disruption to transit operations, technology system integration risks, and organizational change management risks.
2. Do nothing. This option would require reliance on obsolete IT infrastructure and loss of ability to meet new operational requirements.

The alternatives to issuing Contract No. SFMTA-2025-11-LOC do not meet the SFMTA’s need to maintain a state of good repair and to address new operational requirements. Due to Conduent’s proprietary products and services, any to update the CAD/AVL system will require services from Conduent.

FUNDING IMPACT

The term of the Contract is four years and the contract not-to-exceed amount is \$3,497,000. The project budget is allocated in the CAD/AVL Program as approved in the SFMTA FY 2025-2029

Capital Improvement Program.

| Source | Total |
|---|--------------------|
| Population B Baseline | \$2,916,667 |
| Transit Sustainability Development Fees | \$580,333 |
| Total | \$3,497,000 |

ENVIRONMENTAL REVIEW

On September 23, 2024, the SFMTA, under authority delegated by the Planning Department, determined that Contract No. SFMTA 2025-11-LOC is not defined as a “project” under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b).

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

OTHER APPROVALS RECEIVED OR STILL REQUIRED

The SFMTA Contract Compliance Office has approved this procurement.

The City Attorney has reviewed this calendar item.

RECOMMENDATION

Staff recommends that the SFMTA Board of Directors approve Contract No. SFMTA-2025-11-LOC with Conduent Inc. (Conduent) for software design and implementation services to upgrade the Computer Aided Dispatch and Automatic Vehicle Location system (CAD/AVL Software Upgrade Bundle Project), for a contract amount not to exceed \$3,497,000 and a term of four years.

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. _____

WHEREAS, As part of the Radio System Replacement Project Design Build Services, Contract 1240, Conduent designed and implemented a Computer Assisted Dispatch/Automatic Vehicle Location (CAD/AVL) system; and,

WHEREAS, The CAD/AVL System was put into service in November 2016; and,

WHEREAS, The CAD/AVL system is used by SFMTA Transit Division (Muni) managers for real-time management of transit service, transit performance monitoring, and for communication with vehicle operators; and,

WHEREAS, The CAD/AVL Software Upgrade Bundle Project will implement reliable and secure fixed-end IT infrastructure for the CAD/AVL system, migrate data communications to the cellular network, provide better features to manage service changes, and improve the ability to manage headway-based service; and,

WHEREAS, Due to the proprietary nature of the services required to perform upgrades to the existing CAD/AVL System, these services are only available from Conduent, and were procured in accordance with sole source requirements set out in San Francisco Administrative Code Sections 21.5(b) (sole source), 21.5(d) (proprietary articles) and 21.30 (software and associated professional services exemptions); and,

WHEREAS, There is no Local Business Enterprise (LBE) subcontracting participation requirement for this Contract; and,

WHEREAS, On September 23, 2024, the SFMTA, under authority delegated by the Planning Department, determined that Contract No. SFMTA SFMTA-2025-11-LOC for the CAD/AVL Software Upgrade Bundle Project is not defined as a “project” under the California Environmental Quality Act (CEQA) pursuant to Title 14 of the California Code of Regulations Sections 15060(c) and 15378(b); and,

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

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors approves Contract No. SFMTA-2025-11-LOC with Conduent Inc. for software design and implementation services to upgrade the Computer Aided Dispatch and Automatic Vehicle Location system (CAD/AVL Software Upgrade Bundle Project), for a contract amount not to exceed \$3,497,000 and a term of four years.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 6, 2024.

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

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

**Agreement between the City and County of San Francisco
and
Conduent Transport Solutions, Inc.
for
CAD/AVL Systems Bundle Software Services Agreement**

CONTRACT NO: SFMTA-2025-11-LOC

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

**Agreement between the City and County of San Francisco
and
Conduent Transport Solutions, Inc.
for
CAD/AVL System Bundle Software Services**

CONTRACT NO: SFMTA-2025-11-LOC

This Agreement for CAD/AVL System and Support Services (Agreement) is made as of _____, in San Francisco California, by and between Conduent Transport Solutions, Inc., 7160 Riverwood Drive, Columbia, Maryland 21046 (Conduent or Contractor), and the City and County of San Francisco (City), a municipal corporation, acting by and through its Municipal Transportation Agency (SFMTA).

Recitals

A. The SFMTA wishes to contract with Contractor to obtain specified Upgrades to the existing Computer Aided Dispatch and Automatic Vehicle Location (CAD/AVL) System used by the SFMTA.

B. Due to the proprietary nature of the Services required to perform Upgrades to the existing CAD/AVL System, this Agreement was procured in accordance with sole source requirements set out in San Francisco Administrative Code Sections 21.5(b) (sole source), 21.5(d) (proprietary articles) and 21.30 (software and associated professional services exemptions).

C. There is no Local Business Enterprise (LBE) subcontracting participation requirement for this Agreement.

D. Contractor represents and warrants that it is qualified to perform the Services required by City as set forth under this Agreement.

Now, THEREFORE, the Parties agree as follows:

Article 1 Purpose of this Agreement and Defined Terms

1.1 Purpose of this Agreement. The purpose and intent of this Agreement is for the Contractor to deliver the specified Upgrades to the CAD/AVL System, including modified Integrated Vehicle Unit (IVU) firmware, updated application server and client software, as well as database enhancements and new/updated integration that provides associated features and functionality in accordance with the Functional Requirements and Technical Requirements, as described in Appendix A (Scope of Work), Appendix B (Functional Requirements) and Appendix C (Technical Requirements).

1.2 Contractor was a subcontractor to Harris Radio Corporation under the SFMTA's Radio System Replacement Project Design Build Project (Contract 1240, Document No: 00520: Design Build Agreement), dated March 29, 2012 (Radio System Contract). Contractor's obligations under this Contract are limited to providing Services described in Appendix A. Contractor is not responsible for elements of the Radio System for which Contractor was not responsible under the Radio System Contract.

1.3 On August 23, 2024, the SFMTA and Contractor entered into Contract No. SFMTA-2024-11 for CAD/AVL System maintenance and support services and proprietary Equipment (Maintenance Agreement) necessary to ensure the continued operation of the CAD/AVL System provided by Contractor and implemented by Harris Radio Corporation under SFMTA Contract 1240 for the SFMTA's Replacement Radio CAD/AVL System. In the Maintenance Agreement, Contractor's services include professional consulting and support services concerning functions, maintenance, testing, system performance, reliability and safety testing of the CAD/AVL, CAD/AVL subsystems and components, OrbCAD software, ATCS interface, equipment embedded, server-based, and vehicle software, and AVL track layer updates, as more specifically described in Appendix A to the Maintenance Agreement.

1.4 Defined Terms. The following definitions apply to this Agreement. Where any word or phrase defined below, or a pronoun in place of the word or phrase, is used in any part of this Agreement, it shall have the meaning set forth below:

1.4.1 "Acceptance" or "Accepted" means a notice from the SFMTA to Contractor that a Deliverable meets the applicable specifications contained in the Appendix B and Appendix C. The SFMTA's Acceptance of each Deliverable shall be governed by the procedures set forth in Section 4.3.

1.4.2 "Agreement" or "Contract" means this contract document, including all Included Appendices, and all applicable City Ordinances and Mandatory City Requirements that are specifically incorporated into this Agreement by reference as provided herein.

1.4.3 "CAD/AVL" means the Computer Aided Dispatch (CAD) system and Automated Vehicle Location (AVL) system, referred to as the CAD/AVL System, elements of which Contractor provided to the SFMTA as part of the SFMTA's radio system.

1.4.4 “**CCO**” means the SFMTA Contract Compliance Office.

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

1.4.6 “**City Data**” or “**Data**” means that data as described in Article 13 of this Agreement, which includes, without limitation, all data collected, used, maintained, processed, stored, or generated by or on behalf of the City in connection with this Agreement, as well as City’s Confidential Information.

1.4.7 “**CMD**” means the Contract Monitoring Division of the City.

1.4.8 “**Confidential Information**” means information that either Party designates as proprietary and confidential.

1.4.9 “**Contract Administrator**” means the contract administrator assigned to the Contract by the SFMTA, or his or her designated agent.

1.4.10 “**Contract Amount**” means the amount not to exceed amount of compensation stated in Section 3.3.1 of this Contract.

1.4.11 “**Contractor**” or “**Conduent**” means Conduent Transport Solutions, Inc., 7160 Riverwood Drive, Columbia, Maryland 21046.

1.4.12 “**C&P**” means SFMTA Contracts and Procurement

1.4.13 “**Day**” (whether or not capitalized) means a calendar day, unless otherwise designated.

1.4.14 “**Deliverables**” means Contractor’s work product resulting from the Services that are provided by Conduent during the term of the Agreement, including without limitation, the work product described in the “Scope of Work” attached as Appendix A.

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

1.4.16 “**Documentation**” means the technical publications relating to the use of the Licensed Software, such as reference, installation, user, administrative and programmer manuals, and user training materials provided by Contractor to City.

1.4.17 “**Effective Date**” means the date upon which the SFMTA in writing directs the Contractor to commence the Services, and confirms that the City’s Controller has certified the availability of funds for this Agreement as provided in Section 3.1. The date on which this Agreement was executed is indicated on the first page of this Agreement.

1.4.18 “**Errors, Defects and Malfunctions**” means either a deviation between the function of the Software and the Documentation furnished by Contractor for the Software, or a failure of the Software which degrades the use of the Software or otherwise adversely impacts the operation of the CAD/AVL System.

1.4.19 “Force Majeure” means any act of God or any other cause beyond a Party’s control (including, but not limited to, any restriction, strike, lock-out, plant shutdown, material shortage, delay in transportation or delay in performance by its suppliers or subcontractors for any similar cause).

1.4.20 “Issue” means an Error, Defect, or Malfunction in Software.

1.4.21 “Licensed Software” or “Software” mean one or more of the proprietary computer software programs that Contractor provided to the SFMTA under Contract 1240, the Maintenance Agreement, or this Contract, Documentation and all related materials, all Software corrections, patches or updates thereto, and other written information received by City from Contractor, whether in machine-readable, electronic or printed form.

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

1.4.23 “Maintenance Agreement” means Contract No. SFMTA-2024-11 for CAD/AVL System Maintenance and Support Services dated August 23, 2024, for the maintenance and support services relating to the CAD/AVL System.

1.4.24 “Milestone” means the completion of a major phase of a Deliverable that has been Accepted by the SFMTA, as set forth in Appendix D (Milestone Payment Schedule).

1.4.25 “Party” and “Parties” mean the City and Contractor either collectively or individually.

1.4.26 “Priority Category” means a priority assigned to an Error, Defect or Malfunction, designating the urgency of correcting an Error, Defect or Malfunction. Assignment of a Priority Category to an Error, Defect or Malfunction is based on City’s determination of the severity of the Error, Defect or Malfunction and Contractor’s reasonable analysis of the priority of the Error, Defect or Malfunction.

1.4.27 “Project Manager” means the project manager assigned to the Contract for the SFMTA, or his or her designated agent.

1.4.28 “Purchase Order” means the written order issued by the City to the Contractor, authorizing the Effective Date as provided in Section 3.1.

1.4.29 “Radio System” means the SFMTA’s radio communications system.

1.4.30 “Radio System Contract” means SFMTA Contract 1240 between the SFMTA and Harris Radio Corporation, titled “Radio System Replacement Project Design Build Project - Contract 1240, Document No: 00520: Design Build Design Agreement,” dated March 29, 2012 for the replacement of the SFMTA’s radio communications system.

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

1.4.32 “Services” means the labor, general and professional services, project management, Software, Documentation, Software configuration and customization, training, support, System updates, acceptance testing, remote on on-site System support, supervision, materials, actions and other requirements to be performed and furnished by Contractor under this Contract , and other related on-site professional services that are necessary to perform the Upgrades and associated features described in Appendix A and ensure the continued operation and functions of the CAD/AVL System.

1.4.33 “Software” means Licensed Software.

1.4.34 “Source Code” means the human readable compliable form of the Software provided by Contractor.

1.4.35 “Specifications” means the functional and operational characteristics of the System as described in Contractor’s current published product descriptions and technical manuals.

1.4.36 “System” or “CAD/AVL System” means the CAD/AVL Software and ancillary equipment Contractor furnished to the SFMTA under the Radio System Contract and enhanced by the Upgrades performed under this Contract.

1.4.37 “Upgrade” means either an enhancement to the Software code to add new features or functions to the system or software programming revisions containing corrections to Errors, Defects and Malfunctions that have been reported by users or discovered by the Contractor

1.4.38 “Work” means Services.

Article 2 Term of the Agreement

2.1 The term of this Contract shall be four years, commencing on the Effective Date and expiring four years later, unless earlier terminated as otherwise provided herein.

Article 3 Financial Matters

3.1 Certification of Funds; Budget and Fiscal Provisions; Termination in the Event of Non-Appropriation. This Agreement is subject to the budget and fiscal provisions of the City’s Charter. Charges will accrue only after prior written authorization certified by the Controller in the form of a Purchase Order, and the amount of City’s obligation hereunder shall not at any time exceed the amount certified for the purpose and period stated in such advance authorization. This Agreement will terminate without penalty, liability or expense of any kind to City at the end of any fiscal year if funds are not appropriated for the next succeeding fiscal year. If funds are appropriated for a portion of the fiscal year, this Agreement will terminate, without

penalty, liability or expense of any kind at the end of the term for which funds are appropriated. City has no obligation to make appropriations for this Agreement in lieu of appropriations for new or other agreements. City budget decisions are subject to the discretion of the Mayor and the Board of Supervisors. Contractor's assumption of risk of possible non-appropriation is part of the consideration for this Agreement.

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

3.2 Guaranteed Maximum Costs. The City's payment obligation to Contractor cannot at any time exceed the amount certified by City's Controller for the purpose and period stated in such certification. Absent an authorized emergency per the City Charter or applicable Code, no City representative is authorized to offer or promise, nor is the City required to honor, any offered or promised payments to Contractor under this Agreement in excess of the certified maximum amount without the Controller having first certified the additional promised amount and the Parties having modified this Agreement as provided in Section 11.5 (Modification of this Agreement).

3.3 Compensation

3.3.1 Contract Amount. Unless amended as provided in Section 11.5 (Modification of the Agreement), in no event shall the amount of this Agreement exceed Three Million Four Hundred Ninety-Seven Thousand Dollars (\$3,497,000) for the Term of this Agreement. The SFMTA shall pay Contractor for Work performed in accordance with this Agreement.

3.3.2 Payment. SFMTA shall pay Contractor for the Services to be provided in this Agreement after the delivery of each Milestone described in Appendix D (Milestone Payment Schedule). Contractor shall provide SFMTA an invoice for all Services, as provided in Section 3.3.4. Travel expenses shall not be increased by mark-up and Contractor shall make good faith efforts to conform to GSA reimbursement rates and costs standards.

3.3.3 Payment Obligations Limited to Satisfactory Services. Contractor is not entitled to any payments from the City until the SFMTA approves the Work, including any furnished Deliverables, as satisfying all the requirements of this Agreement. Payments to Contractor by the City shall not excuse Contractor from its obligation to replace unsatisfactory Deliverables, including equipment, components, materials, or Work even if the unsatisfactory character of such Deliverables, Software, components, materials or Work may not have been apparent or detected at the time such payment was made. Deliverables, Software, components, materials and Work that do not conform to the requirements of this Agreement may be rejected by the City and in such case must be replaced by Contractor without delay at no cost to the City. If the City accepts part of a Deliverable and begins beneficial use of that Deliverable, the City will pay Contractor from the portion of the Deliverable that is in use.

3.3.4 Invoice Format. Invoices furnished by Contractor under this Agreement must be in a form acceptable to City's Controller and SFMTA, and must include the Contract Progress Payment Authorization number. Contractor shall submit invoices electronically with each invoice containing the following information, as applicable:

- (a) Contract Number
- (b) Purchase Order Number
- (c) Description of the Work for which Contractor seeks compensation
- (d) Milestone achieved with the record of Acceptance by the SFMTA Project Manager approving the Milestone.
- (e) Total amount invoiced.
- (f) Form 7 – CMD Progress Payment Form

3.3.5 Progress Payment Form. City's Controller is not authorized to pay invoices submitted by Contractor prior to Contractor's submission of the SFMTA Progress Payment Form. If the Progress Payment Form is not submitted with Contractor's invoice, SFMTA will notify Contractor of the omission. If Contractor's failure to provide the SFMTA Progress Payment Form is not explained to SFMTA's satisfaction, SFMTA will withhold 20 percent of the payment due pursuant to that invoice until the SFMTA Progress Payment Form is provided.

3.3.6 LBE Payment and Utilization Tracking System. Contractor shall pay LBE subcontractors within three business days as provided under Chapter 14B.7(H)(9). Within ten business days of the SFMTA's payment of an invoice, Contractor shall confirm that all subcontractors have been paid via the B2GNow System (<https://sfmta.diversitycompliance.com/>) unless instructed otherwise by CMD or CCO. Failure to submit all required payment information into the B2GNow System with each payment request may result in the withholding of 20% of the payment due.

3.3.7 Payment Terms

(a) **Payment Due Date.** Unless SFMTA notifies Contractor that a dispute exists, SFMTA shall endeavor to issue payment to Contractor for undisputed charges within Thirty (30) Days the date of SFMTA's receipt of Contractor's invoice. Payment is deemed to be made on the date on which City has issued a check to Contractor or, if Contractor has agreed to electronic payment, the date on which City has posted the electronic payment to Contractor.

(b) **No Interest or Late Charges.** No additional charge shall accrue against City in the event City does not make payment within any time specified in this Agreement. In no event shall City be liable for interest or late charges for any late payments.

3.3.8 Payment Process.

(a) The City utilizes a commercial product through its banking partner to pay City contractors electronically. Contractors shall sign up to receive electronic payments to be paid under this Agreement. To sign up for electronic payments, visit [SF City Partner at sfgov.org](https://sfgov.org).

(b) At the option of City, Contractor may be required to submit invoices directly in the City's financial and procurement system. Refer to <https://sfcitypartner.sfgov.org/pages/training.aspx> for more information.

3.3.9 Submitting False Claims. The full text of San Francisco Administrative Code Chapter 21, Section 21.35, including the enforcement and penalty provisions, is incorporated into this Agreement. Pursuant to San Francisco Administrative Code §21.35, any contractor or subcontractor who submits a false claim shall be liable to the City for the statutory penalties set forth in that section. A contractor or subcontractor will be deemed to have submitted a false claim to the City if the contractor or subcontractor: (a) knowingly presents or causes to be presented to an officer or employee of the City a false claim or request for payment or approval; (b) knowingly makes, uses, or causes to be made or used a false record or statement to get a false claim paid or approved by the City; (c) conspires to defraud the City by getting a false claim allowed or paid by the City; (d) knowingly makes, uses, or causes to be made or used a false record or statement to conceal, avoid, or decrease an obligation to pay or transmit money or property to the City; or (e) is a beneficiary of an inadvertent submission of a false claim to the City, subsequently discovers the falsity of the claim, and fails to disclose the false claim to the City within a reasonable time after discovery of the false claim.

3.3.10 Payment Does Not Constitute Acceptance. The issuing of any payment by City, or the receipt thereof by Contractor shall not constitute or imply acceptance of Work by City, waive any requirement of this Agreement, or in any way compromise or amend Contractor's obligation to reperform or replace unsatisfactory Work although the unsatisfactory character of such Work may not have been apparent or detected at the time such payment was made. Work that does not conform to the requirements of this Agreement may be rejected by City and in such case must be reperformed or replaced (as applicable) by Contractor without delay. City may withhold payment to Contractor in any instance in which Contractor has failed or refused to satisfy any material obligation of this Agreement. Payment for Services shall not constitute or be deemed a waiver of any provision of this Agreement.

3.3.11 Withhold Payments. If Contractor fails to provide goods and/or Services in accordance with Contractor's obligations under this Agreement, City may withhold any and all payments due Contractor until such failure to perform is cured, and Contractor shall not stop work as a result of City's withholding of payments as provided herein.

3.4 Audit and Inspection of Records. Contractor agrees to make available to City, during regular business hours, existing records relating to the Services. Contractor will permit City to audit, examine and make copies from such books and records of Services provided under this Agreement. Contractor shall maintain such data and records in an accessible location and

condition for a period of not less than three years after final payment under this Agreement or until after final audit has been resolved, whichever is later. The State of California or any Federal agency having an interest in the subject matter of this Agreement shall have the same rights as conferred upon City by this Section. Contractor shall include the same audit and inspection rights and record retention requirements in all subcontracts.

3.5 Payment of Prevailing Wages

3.5.1 Covered Services. City and Contractor do not intend that the Services shall include any work that constitutes construction trade work or Public Works as defined in San Francisco Administrative Code Chapter 6 or applicable California laws. SFMTA will separately contract with licensed construction contractor(s) to perform any work related to the System that requires a contractor's license under the California Business and Professions Code or other applicable California law. But should any of the Services be deemed by any agency with relevant regulatory authority to constitute trade work covered by the provisions of San Francisco Labor and Employment Code Article 102 or applicable State law (collectively, "Covered Services"), then the wages and benefits rates referenced in Section 3.5.2 shall apply to this Agreement. The provisions of San Francisco Labor and Employment Code Article 102 are incorporated into this Agreement as if fully set forth herein and will apply to any Covered Services performed by Contractor and its subcontractors.

3.5.2 Wage Rates. The latest prevailing wage rates for private employment on public works contracts and Covered Services, as determined by the San Francisco Board of Supervisors and the Director of the California Department of Industrial Relations (DIR), as such prevailing wage rates may be changed during the term of this Agreement, are incorporated as provisions of this Agreement. Copies of the prevailing wage rates as fixed and determined by the Board of Supervisors are available from the Office of Labor Standards and Enforcement (OLSE) and on the Internet at <http://www.dir.ca.gov/DLSR/PWD> and <http://sfgov.org/olse/prevailing-wage>. Contractor agrees that it shall pay not less than the prevailing wage rates, as fixed and determined by the Board, to all workers employed by Contractor who perform Covered Services under this Agreement.

3.5.3 Subcontract Requirements. As required by San Francisco Labor and Employment Code Article 102, Contractor shall insert in every subcontract or other arrangement that it may make for the performance of Covered Services under this Agreement, a provision that said subcontractor shall pay to all persons performing labor in connection with Covered Services under said subcontract or other arrangement not less than the highest general prevailing rate of wages as fixed and determined by the Board of Supervisors for such labor or services.

3.5.4 Posted Notices. As required by Section 1771.4 of the California Labor Code, Contractor shall post job site notices prescribed by DIR at all job sites where Covered Services (that are subject to San Francisco Administrative Code Section 6.22) are to be performed.

3.5.5 Payroll Records. As required by San Francisco Labor and Employment Code Article 102 and Section 1776 of the California Labor Code, Contractor shall keep or cause to be kept complete and accurate payroll records for all trade workers performing Covered Services. Such records shall include the name, address and social security number of each worker who provided Covered Services under this Agreement, including apprentices, his or her classification, a general description of the services each worker performed each Day, the rate of pay (including rates of contributions for, or costs assumed to provide fringe benefits), daily and weekly number of hours worked, deductions made and actual wages paid. Every subcontractor who shall undertake the performance of any part of Covered Services shall keep a like record of each person engaged in the execution of Covered Services under the subcontract. All such records shall at all times be available for inspection of and examination by City and its authorized representatives and the DIR.

3.5.6 Certified Payrolls. Certified payrolls shall be prepared pursuant to Administrative Code Section 6.22(e)(6), San Francisco Labor and Employment Code Article 102, and California Labor Code Section 1776 for the period involved for all employees, including those of subcontractors, who performed labor in connection with Covered Services. Contractor and each subcontractor performing Covered Services shall submit certified payrolls to City and to the DIR electronically. Contractor shall submit payrolls to City via the reporting system selected by City. The DIR will specify how to submit certified payrolls to it. City will provide basic training in the use of the reporting system at a scheduled training session. Contractor and all subcontractors that will perform Covered Services must attend the training session. Contractor and applicable subcontractors shall comply with electronic certified payroll requirements (including training) at no additional cost to City.

3.5.7 Compliance Monitoring. Covered Services are subject to compliance monitoring and enforcement of prevailing wage requirements by the California Department of Industrial Relations (DIR) and/or City's Office of Labor Standards Enforcement (OLSE). Contractor and any subcontractors performing Covered Services will cooperate fully with the DIR and/or the OLSE and other City employees and agents authorized to assist in the administration and enforcement of the prevailing wage requirements, and agrees to take the specific steps and actions as required by San Francisco Labor and Employment Code Article 102. Steps and actions include but are not limited to requirements that: (i) Contractor will cooperate fully with the OLSE Enforcement Officer and other City employees and agents authorized to assist in the administration and enforcement of the Prevailing Wage requirements and other labor standards imposed on Public Works Contractors by the Charter and Chapter 6 of the San Francisco Administrative Code; (ii) Contractor agrees that the OLSE Enforcement Officer and his or her designees, in the performance of their duties, shall have the right to engage in random inspections of job sites and to have access to the employees of Contractor, employee time sheets, inspection logs, payroll records and employee paychecks; (iii) Contractor shall maintain a sign-in and sign-out sheet showing which employees are present on the job site; (iv) Contractor shall prominently post at each job-site a sign informing employees that the Services

are subject to City's Prevailing Wage requirements and that these requirements are enforced by the OLSE Enforcement Officer. (v) that the OLSE Enforcement Officer may audit such records of Contractor as he or she reasonably deems necessary to determine compliance with the Prevailing Wage and other labor standards imposed by the Charter and this Chapter on Public Works Contractors. Failure to comply with these requirements may result in penalties and forfeitures consistent with analogous provisions of the California Labor Code, including Section 1776(g), as amended from time to time.

3.5.8 Remedies. Should Contractor, or any subcontractor who shall undertake the performance of any Covered Services, fail or neglect to pay to the persons who perform Covered Services under this Agreement, subcontract or other arrangement for the Covered Services, the general prevailing rate of wages as herein specified, Contractor shall forfeit, and in the case of any subcontractor so failing or neglecting to pay said wage, Contractor and the subcontractor shall jointly and severally forfeit, back wages due plus the penalties set forth in San Francisco Labor and Employment Code Article 102 and/or California Labor Code Section 1775. When certifying any payment which may become due under the terms of this Agreement, City will deduct from the amount that would otherwise be due on such payment the amount of said forfeiture.

Article 4 Services and Resources

4.1 Services Contractor Agrees to Perform. Contractor agrees to perform the Services stated in Appendix A (Scope of Work). Officers and employees of the City are not authorized to request, and the City is not required to reimburse the Contractor for, Services beyond the Scope of Services listed in Appendix A, unless Appendix A is modified as provided in Section 11.5 (Modification of this Agreement).

4.2 Services and System Performance Standards. Contractor agrees to perform the Services to perform Upgrades to the CAD/AVL System described in Appendix A so that it meets the Functional Requirements described in Appendix B and Technical Requirements specified in Appendix C.

4.2.1 Services to be Provided in this Agreement. The Services for each Deliverable, as more specifically described in Appendix A, include the following:

- (a) Requirements Analysis
- (b) Software Design
- (c) Software Development
- (d) Factory Testing
- (e) Deployment
- (f) Acceptance Testing
- (g) User Training
- (h) Defect Resolution
- (i) Project Management

4.3 Acceptance Procedure. After Contractor has performed the Work identified in Appendix A for each Deliverable, Contractor will provide the SFMTA Project Manager with the site test results for the Deliverable. The SFMTA shall have a period of 20 business days from the date of the receipt of the site test results (Acceptance Period) to verify that the Software performs to the specifications contained in Appendix B and Appendix C. In the event that the SFMTA determines that the Software does not meet such specifications, the SFMTA shall notify the Contractor in writing, and Contractor shall modify or correct the Software so that it satisfies the specifications at no additional charge to the SFMTA. The date of Acceptance will be that date upon which the SFMTA provides Contractor with written notice of satisfaction, and the notice of Acceptance shall be included in Contractor's invoice for payment of the Deliverable. If the SFMTA does not respond to Contractor within the Acceptance Period, the Deliverable shall be deemed Accepted on the expiration of the Acceptance Period for purposes of providing Contractor payment under the provisions of Article 3. If the SFMTA notifies Contractor after the Acceptance Period that the Software does not meet the specifications contained in Appendix B and Appendix C, then Contractor shall perform corrections under the provisions of Section 4.9 (Services and Warranties Provided Under Maintenance Agreement) so that the Software satisfies the specifications.

4.4 Qualified Personnel. Contractor represents and warrants that it is qualified to perform the Services required by City, and that all Services will be performed by competent personnel with the degree of skill and care required by current and sound professional procedures and practices. Contractor will comply with City's reasonable requests regarding assignment and/or removal of personnel, but all personnel, including those assigned at City's request, must be supervised by Contractor. Contractor shall commit sufficient resources for timely completion within the project schedule. The SFMTA reserves the right to require the Contractor to reassign any individual on the Contractor's project team if the SFMTA is unsatisfied with that person's performance or that person fails to demonstrate the required qualifications or expertise. The SFMTA reserves the right to review and approve any replacement of team members, and the right to reject invoices submitted related to work performed by replacement team members that the SFMTA did not approve.

4.5 Subcontracting

4.5.1 Contractor may subcontract portions of the Services only upon prior written approval of the SFMTA. Contractor is responsible for its subcontractors throughout the course of the work required to perform the Services. All subcontracts must incorporate the terms of Article 10 (Additional Requirements Incorporated by Reference) of this Agreement, unless inapplicable. Neither Party shall, on the basis of this Agreement, contract on behalf of, or in the name of, the other Party. Any agreement made in violation of this provision shall be null and void.

4.5.2 No Subcontractors will be used in to perform Work under this Agreement.

4.6 Independent Contractor; Payment of Employment Taxes and Other Expenses

4.6.1 Independent Contractor. For the purposes of this Section 4.6, “Contractor” shall be deemed to include not only Contractor, but also any agent or employee of Contractor. Contractor acknowledges and agrees that at all times, Contractor or any agent or employee of Contractor shall be deemed at all times to be an independent contractor and is wholly responsible for the manner in which it performs the services and work requested by City under this Agreement. Contractor, its agents, and employees will not represent or hold themselves out to be employees of the City at any time. Contractor or any agent or employee of Contractor shall not have employee status with City, nor be entitled to participate in any plans, arrangements, or distributions by City pertaining to or in connection with any retirement, health or other benefits that City may offer its employees. Contractor or any agent or employee of Contractor is liable for the acts and omissions of itself, its employees and its agents. Contractor shall be responsible for all obligations and payments, whether imposed by federal, state or local law, including, but not limited to, FICA, income tax withholdings, unemployment compensation, insurance, and other similar responsibilities related to Contractor’s performing services and work, or any agent or employee of Contractor providing same. Nothing in this Agreement shall be construed as creating an employment or agency relationship between City and Contractor or any agent or employee of Contractor. Any terms in this Agreement referring to direction from City shall be construed as providing for direction as to policy and the result of Contractor’s work only, and not as to the means by which such a result is obtained. City does not retain the right to control the means or the method by which Contractor performs work under this Agreement. Contractor agrees to maintain and make available to City, upon request and during regular business hours, accurate books and accounting records demonstrating Contractor’s compliance with this Section. Should City determine that Contractor, or any agent or employee of Contractor, is not performing in accordance with the requirements of this Agreement, City shall provide Contractor with written notice of such failure. Within five business days of Contractor’s receipt of such notice, and in accordance with Contractor policy and procedure, Contractor shall remedy the deficiency. Notwithstanding, if City believes that an action of Contractor, or any agent or employee of Contractor, warrants immediate remedial action by Contractor, City shall contact Contractor and provide Contractor in writing with the reason for requesting such immediate action.

4.6.2 Payment of Employment Taxes and Other Expenses. Should City, in its discretion, or a relevant taxing authority such as the Internal Revenue Service or the State Employment Development Division, or both, determine that Contractor is an employee for purposes of collection of any employment taxes, the amounts payable under this Agreement shall be reduced by amounts equal to both the employee and employer portions of the tax due (and offsetting any credits for amounts already paid by Contractor which can be applied against this liability). City shall then forward those amounts to the relevant taxing authority. Should a relevant taxing authority determine a liability for past services performed by Contractor for City,

upon notification of such fact by City, Contractor shall promptly remit such amount due or arrange with City to have the amount due withheld from future payments to Contractor under this Agreement (again, offsetting any amounts already paid by Contractor which can be applied as a credit against such liability). A determination of employment status pursuant to this Section 4.6 shall be solely limited to the purposes of the particular tax in question, and for all other purposes of this Agreement, Contractor shall not be considered an employee of City. Notwithstanding the foregoing, Contractor agrees to indemnify and hold harmless City and its officers, agents and employees from, and, if requested, shall defend them against any and all claims, losses, costs, damages, and expenses, including attorneys' fees, arising from this Section.

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

4.8 Warranty. Contractor warrants to City that the Services will be performed with the degree of skill and care that is required by current, good and sound professional procedures and practices, and in conformance with generally accepted professional standards prevailing at the time the Services are performed so as to ensure that all Services performed are correct and appropriate for the purposes contemplated in this Agreement. Contractor warrants that the Services provided under this Agreement will meet the Functional Requirements in Appendix B and Technical Requirements in Appendix C. Contractor warrants to the SFMTA that the upgraded Software that Contractor provides under this Agreement shall be correct and serve its intended purpose, free from defects in material and workmanship and shall conform to its published specifications for the term of this Agreement.

4.9 Services and Warranties Provided Under Maintenance Agreement .. The Parties agree that the professional consulting and support services concerning repair, replacement, functions, maintenance, testing, system performance, reliability and safety testing, and warranty for the Upgrades and associated features described in this Agreement shall be governed by the Maintenance Agreement at no additional charge to the SFMTA.

Article 5 Insurance and Indemnity

5.1 Insurance.

5.1.1 Required Coverages. Without in any way limiting Contractor's liability pursuant to the "Indemnification" section of this Agreement, Contractor must maintain in force, during the full term of the Agreement, insurance in the following amounts and coverages:

(a) Commercial General Liability Insurance with limits not less than Two Million Dollars (\$2,000,000) each occurrence for Bodily Injury and Property Damage, including Contractual Liability, Personal Injury, Products and Completed Operations.

(b) Commercial Automobile Liability Insurance with limits not less than Two Million Dollars (\$2,000,000) each occurrence, "Combined Single Limit" for Bodily Injury and Property Damage, including Owned, Non-Owned and Hired auto coverage, as applicable.

(c) Workers' Compensation, in statutory amounts, with Employers' Liability Limits not less than One Million Dollars (\$1,000,000) each accident, injury, or illness.

(d) Professional Liability Insurance, applicable to Contractor's profession, with limits not less than One Million Dollars (\$1,000,000) for each claim with respect to negligent acts, errors or omissions in connection with the Services.

(e) Technology Errors and Omissions Liability coverage, with limits of Five Million Dollars (\$5,000,000) for each claim and each loss. The policy shall at a minimum cover professional misconduct or lack of the requisite skill required for the performance of services defined in the Agreement and shall also provide coverage for the following risks:

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

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

(f) Cyber and Privacy Insurance with limits of not less than Five Million Dollars (\$5,000,000) per claim. Such insurance shall include coverage for liability arising from theft, dissemination, and/or use of confidential information, including but not limited to, bank and credit card account information or personal information, such as name, address, social security numbers, protected health information or other personally identifying information, stored or transmitted in electronic form.

5.1.2 Additional Insured Endorsements

(a) The Commercial General Liability policy must be endorsed to name as Additional Insured the City and County of San Francisco, its Officers, Agents, and Employees.

(b) The Commercial Automobile Liability Insurance policy must be endorsed to name as Additional Insured the City and County of San Francisco, its Officers, Agents, and Employees.

(c) The Commercial Automobile Liability Insurance policy must be endorsed to include (i) Additional Insured Endorsement naming as Additional Insured the City and County of San Francisco, its Officers, Agents, and Employees; and (ii) Form MCS-90 for Motor Carrier Policies of Insurance for Public Liability under Sections 29 and 30 of the Motor Carrier Act of 1980.

5.1.3 Waiver of Subrogation Endorsements

(a) The Workers' Compensation policy(ies) shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents and subcontractors.

5.1.4 Primary Insurance Endorsements

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

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

5.1.5 Other Insurance Requirements

(a) Thirty days' advance written notice shall be provided to the City of cancellation, intended non-renewal, or reduction in coverages, except for non-payment, for which no less than 10 Days' notice shall be provided to City. Notices shall be sent to the City address set forth in Section 11.1 (Notices to the Parties). All notices, certificates and endorsements shall include the SFMTA contract number and title on the cover page.

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

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

(d) Should any required insurance lapse during the term of this Agreement, requests for payments originating after such lapse shall not be processed until the City receives satisfactory evidence of reinstated coverage as required by this Agreement, effective as of the lapse date. If insurance is not reinstated, the City may, at its sole option, terminate this Agreement effective on the date of such lapse of insurance.

(e) Before commencing any Services, Contractor shall furnish to City certificates of insurance and additional insured policy endorsements from insurers with ratings comparable to A-, VIII or higher that are authorized to do business in the State of California, and that are satisfactory to City, in form evidencing all coverages set forth above. Approval of the insurance by City shall not relieve or decrease Contractor's liability hereunder.

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

5.2 Indemnification. Contractor shall indemnify and hold harmless City and its officers, agents and employees from, and, if requested, shall defend them from and against any and all claims, demands, losses, damages, costs, expenses, and liability (legal, contractual, or otherwise) arising from or in any way connected with any: (i) injury to or death of a person, including employees of City or Contractor; (ii) loss of or damage to property; (iii) violation of local, state, or federal common law, statute or regulation, including but not limited to privacy or personally identifiable information, health information, disability and labor laws or regulations; (iv) strict liability imposed by any law or regulation; or (v) losses arising from Contractor's execution of subcontracts not in accordance with the requirements of this Agreement applicable to subcontractors; so long as such injury, violation, loss, or strict liability (as set forth in subsections (i) – (v) above) arises directly or indirectly from Contractor's negligent performance of this Agreement or willful misconduct, including, but not limited to, Contractor's use of facilities or equipment provided by City or others, regardless of the negligence of, and regardless of whether liability without fault is imposed or sought to be imposed on City, except to the extent that such indemnity is void or otherwise unenforceable under applicable law, and except where such loss, damage, injury, liability or claim is the result of the active negligence or willful misconduct of City and is not contributed to by any act of, or by any omission to perform some duty imposed by law or agreement on Contractor, its subcontractors, or either's agent or employee. The foregoing indemnity shall include, without limitation, reasonable fees of attorneys, consultants and experts and related costs and City's costs of investigating any claims against the City.

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

5.2.1 Limitations. No insurance policy covering the Contractor's performance under this Agreement shall operate to limit the Contractor's Liabilities under this provision. Nor shall the amount of insurance coverage operate to limit the extent of such Liabilities.

5.2.2 Intellectual Property Infringement. Contractor shall also indemnify, defend and hold harmless all Indemnitees from all suits or claims for infringement of the patent rights, copyright, trade secret, trade name, trademark, service mark, or any other proprietary right of any person or persons in consequence of the use by the City, or any of its boards, commissions, officers, or employees of articles, Software, or other Deliverables supplied in the performance of Work. Infringement of patent rights, copyrights, or other proprietary rights in the performance of this Agreement, if not the basis for indemnification under the law, shall nevertheless be considered a material breach of contract.

Article 6 Liability of the Parties

6.1 Liability of City. City's payment obligations under this Contract shall be limited to the payment of the compensation provided for in Article 3, above.

6.2 Liability for Use of Equipment. City shall not be liable for any damage to persons or property resulting from Contractor's use, misuse or failure of any equipment or tools used by Contractor, or any of its subcontractors, or by any of their employees, even though such equipment or tools are furnished, rented or loaned by City.

6.3 Limitations on Liability

6.3.1 The City, its boards and commissions, and all of their officers, agents, members, employees, and authorized representatives shall have no liability to Contractor for any type of special, consequential, indirect or incidental damages, including, but not limited to, lost profits, arising under or related to the Work or this Contract or under any cause of action related to the subject matter of this Contract, whether in contract, tort (including negligence), strict liability, or otherwise. This limit of liability applies under all circumstances including, but not limited to, the breach, completion, termination, suspension, cancellation or rescission of the Work or this Contract, negligence or strict liability by the City, its boards and commissions, and their representatives, consultants or agents.

6.3.2 Except as stated here, Contractor shall have no liability to City for any type of special, consequential, incidental or punitive damages arising out of or connected with Contractor's performance of the Work.

6.3.3 Contractor's liability to the City for breach of contract or negligence under this Agreement shall not exceed the value of the maintenance fees the SFMTA has paid Contractor under this Agreement in the year the breach of contract or negligent act occurred.

6.3.4 The limitations on Contractor's liability stated in this Section 6.3 applies under all circumstances including, but not limited to, the breach, completion, termination, suspension or cancellation of the Work under this Contract, and negligence or strict liability of Contractor. This limit of liability shall NOT, however, apply to, limit or preclude:

(a) Contractor's obligation to pay Liquidated Damages imposed by ordinance or statute;

(b) Damages caused by Contractor's gross negligence, reckless conduct, willful acts or omissions, fraud or illegal or unlawful acts;

(c) Contractor's obligations to indemnify and defend the City and other indemnified parties as set forth in Section 5.2;

(d) Contractor's liability damages that fall within the insurance coverages required under the Contract;

(e) Contractor's liability for statutory damages imposed by the City upon Contractor under City Ordinances and Municipal Codes;

(f) Fines, penalties and statutory damages, including punitive damages, treble damages, and statutory attorney fees and costs;

(g) Contractor's warranties and guarantees under the Contract Documents;

(h) Damages and other liability arising under claims by third parties for loss or damage to property or personal injuries, including wrongful death;

(i) Liability for violation of environmental regulations and laws; and

(j) Damages and other liability for infringement of any copy right, patent, or other intellectual property right.

Article 7 Payment of Taxes

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

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

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

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

7.2.3 Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that other events also may cause a change of ownership of the possessory interest and result in the revaluation of the possessory interest. (see, e.g., Rev. & Tax. Code Section 64, as amended from time to time). Contractor accordingly agrees on behalf of itself and its permitted successors and assigns to report any change in ownership to the County Assessor, the State Board of Equalization or other public agency as required by law.

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

7.3 Withholding. Contractor agrees that it is obligated to pay all amounts due to the City under the San Francisco Business and Tax Regulations Code during the term of this Agreement. Pursuant to Section 6.10-2 of the San Francisco Business and Tax Regulations Code, Contractor further acknowledges and agrees that City may withhold any payments due to Contractor under this Agreement if Contractor is delinquent in the payment of any amount required to be paid to the City under the San Francisco Business and Tax Regulations Code. Any payments withheld under this paragraph shall be made to Contractor, without interest, upon Contractor coming back into compliance with its obligations.

Article 8 Termination and Default

8.1 Termination for Convenience

8.1.1 City shall have the option, in its sole discretion, to terminate this Agreement, at any time during the term hereof, for convenience and without cause. City shall exercise this option by giving Contractor 30 Days prior written notice of termination. The notice shall specify the date on which termination shall become effective.

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

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

(b) Terminating all existing orders and subcontracts, and not placing any further orders or subcontracts for materials, Work, Software or other items.

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

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

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

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

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

(a) The reasonable compensation to Contractor, without for all Work performed prior to the specified termination date, for which the SFMTA has not already tendered payment, and the total of any Contractor costs resulting directly from the termination. Lost profits are not costs and the SFMTA shall not compensate for lost profits. The reasonable cost to Contractor of handling material returned to the vendor, delivered to the SFMTA or otherwise disposed of as directed by the SFMTA.

(b) A deduction for the cost of materials to be retained by Contractor, amounts realized from the sale of materials and not otherwise recovered by or credited to the SFMTA, and any other appropriate credits to the SFMTA against the cost of the Work or other Work.

8.1.4 In no event shall the City be liable for costs incurred by Contractor or any of its subcontractors after the termination date specified by the SFMTA, except for those costs specifically enumerated and described in Section 8.1.3.

8.1.5 In arriving at the amount due to Contractor under this Section, the SFMTA may deduct: (i) all payments previously made by the SFMTA for Work covered by Contractor's final invoice; (ii) any claim which the SFMTA may have against Contractor in connection with this Agreement; (iii) any invoiced costs or expenses excluded pursuant to the immediately preceding subsection 8.1.4.

8.1.6 Payment Obligation. The City's payment obligation under this Section shall survive termination of this Agreement. SFMTA's payment obligation under this Section shall survive termination of this Agreement.

8.2 Termination for Default; Remedies.

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

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

- 3.3.9 Submitting False Claims
- 4.7 Assignment
- Article 5 Insurance and Indemnity
- Article 7 Payment of Taxes
- 10.10 Alcohol and Drug-Free Workplace
- 11.10 Compliance with Laws
- Article 13 Data and Security

(b) Contractor fails or refuses to perform or observe any other material term, covenant or condition contained in this Agreement, including any obligation imposed by ordinance or statute and incorporated by reference herein.

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

(d) A court or government authority enters an order (i) appointing a custodian, receiver, trustee or other officer with similar powers with respect to Contractor or with respect to any substantial part of Contractor's property, (ii) constituting an order for relief or approving a petition for relief or reorganization or arrangement or any other petition in bankruptcy or for liquidation or to take advantage of any bankruptcy, insolvency or other

debtors' relief law of any jurisdiction or (iii) ordering the dissolution, winding-up or liquidation of Contractor.

8.2.2 To the extent that City is aware of any Event of Default or other breach of the Agreement by Contractor, the City shall provide Contractor written notice of the Event of Default or other breach of the Agreement. Contractor shall have 30 Days from the date of such notice to cure its default or breach. If it is not possible for Contractor to cure said default or breach within that time, Contractor shall so inform the City in writing and shall commit to a date by which Contractor will cure said default or breach, subject to the City's approval. Where it is evident that Contractor's default or breach is not possible to cure, the 30-Day cure period shall not apply.

8.2.3 Default Remedies. Following expiration of the 30-Day cure period described in the preceding section, on and after any Event of Default, City shall have the right to exercise its legal and equitable remedies, including, without limitation, the right to terminate this Agreement. In addition, where applicable, City shall have the right (but no obligation) to cure (or cause to be cured) on behalf of Contractor any Event of Default; Contractor shall pay to City on demand all costs and expenses incurred by City in effecting such cure, with interest thereon from the date of incurrence at the maximum rate then permitted by law. If Contractor defaults and does not pay the City's costs and expenses incurred in effecting such a cure, then the City shall have the right to offset from any amounts due to Contractor under this Agreement or any other agreement between City and Contractor: (i) all damages, losses, costs or expenses incurred by City as a result of an Event of Default; and (ii) any liquidated damages levied upon Contractor pursuant to the terms of this Agreement; and (iii), any damages imposed by any ordinance or statute that is incorporated into this Agreement by reference, or into any other agreement with the City.

8.2.4 All remedies provided for in this Agreement may be exercised individually or in combination with any other remedy available hereunder or under applicable laws, rules and regulations. The exercise of any remedy shall not preclude or in any way be deemed to waive any other remedy. Nothing in this Agreement shall constitute a waiver or limitation of any rights that City may have under applicable law.

8.2.5 Any notice of default must be sent by registered mail to the address set forth in Article 11.

8.3 Non-Waiver of Rights. The omission by either Party at any time to enforce any default or right reserved to it, or to require performance of any of the terms, covenants, or provisions hereof by the other Party at the time designated, shall not be a waiver of any such default or right to which the Party is entitled, nor shall it in any way affect the right of the Party to enforce such provisions thereafter.

8.4 Rights and Duties upon Termination or Expiration.

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

| | |
|------------|--|
| 3.3.3 | Payment Obligations Limited to Satisfactory Services |
| 3.3.9 | Submitting False Claims |
| 3.4 | Audit and Inspection of Records |
| Article 5 | Insurance and Indemnity |
| Article 6 | Liability of the Parties |
| Article 7 | Payment of Taxes |
| 8.1.6 | Payment Obligation |
| 8.2.3 | Default Remedies |
| Article 9 | Rights in Deliverables and Software Licenses |
| 11.6 | Dispute Resolution Procedure |
| 11.7 | Agreement Made in California; Venue |
| 11.8 | Construction |
| 11.9 | Entire Agreement |
| 11.10 | Compliance with Laws |
| 11.11 | Severability |
| Article 13 | Data and Security |

8.4.2 Subject to the survival of the Sections identified in Section 8.4.1 above, if this Agreement is terminated prior to expiration of the term specified in Article 2, this Agreement shall be of no further force or effect. Contractor shall transfer title to City, and deliver in the manner, at the times, and to the extent, if any, directed by City, any Work in progress, completed Work, supplies, Software, and other materials produced as a part of, or acquired in connection with the performance of this Agreement, and any completed or partially completed Work which, if this Agreement had been completed, would have been required to be furnished to City.

8.5 Discontinuance of Services. Contractor agrees that in the event it ceases to sell CAD/AVL Systems for transit applications, or otherwise ceases to market and/or provide proprietary Software, equipment or maintenance Services for the System, and there is no successor in interest by merger, operation of law, assignment, purchase, or otherwise, Contractor shall provide City, without charge, one (1) copy of the then-current Source Code for all of the programs and all supporting Documentation for the Software then operating and installed at City's locations. If City should obtain the Source Code and the Documentation pursuant to this section, the only use made of the Source Code and the Documentation will be for the SFMTA's maintenance of the System. Contractor shall also make available for City to purchase at reasonable commercial rates all proprietary equipment that SFMTA deems is necessary for the Agency to continue to operate the System for a period of three years, to provide the SFMTA sufficient time to budget, plan, and acquire a replacement to the System.

8.6 This Agreement Does Not Modify Contract 1240. This Agreement does not modify or waive any provision of the Radio System Contract (SFMTA Contract 1240), or any provision of the Radio System Contract that by the terms of that agreement survives the termination or expiration of the Radio System Contract.

Article 9 Rights In Deliverables and Software Licenses

9.1 Ownership of Results. Any interest of Contractor or its subcontractors, in the Deliverables, including any drawings, plans, specifications, blueprints, studies, reports, memoranda, computation sheets, computer files and media or other documents prepared by Contractor or its subcontractors solely for the purposes of maintaining the System or performing the Services, shall become the property of and will be transmitted to City. However, unless expressly prohibited elsewhere in this Agreement, Contractor may retain and use copies for reference and as documentation of its experience and capabilities.

9.2 Software Licenses and Use

9.2.1 License. Contractor has licensed to City the CAD/AVL Software and Documentation and related software and documentation that Contractor provided to SFMTA under the Radio System Contract and any subsequent contract between Contractor and the City, including but not limited to the Task Order Contract, SFMTA Contract 2018-49 and the Maintenance Agreement.

9.2.2 Additional Licenses. For Software that Contractor provides under this Agreement or has provided under other contracts that is not covered by the preceding Section 9.2.1, Contractor grants City a non-exclusive, non-transferable, perpetual, restricted license to use the Software purchased under this Agreement from the date of full payment for same, but only for City's its own operation and maintenance of the Radio System. City has no right to grant sublicenses. Contractor warrants that it has the title to and/or authority to grant said license(s) and sublicenses(s) to City. For avoidance of doubt, the license rights granted by the Radio System Contract, this Agreement, the Task Order Agreement, the Maintenance Agreement, and any subsequent agreement between the Parties concerning the CAD/AVL System and its Software (Documentation) shall be identical. Any right(s) granted to SFMTA under one agreement shall be applied to all agreements between the Parties concerning the System and Software, so that there is no gap, conflict or discontinuity in licensed rights from one agreement to another.

9.2.3 Third-Party Software. City and County of San Francisco shall be listed as the licensee and authorized end-user on each future provided Software license, where applicable as stated in Appendix A. All such licenses for such third-party software that Contractor provides to City under this Agreement shall grant to City a non-exclusive, non-transferable, perpetual, license to use said Software for the operation and maintenance of the Radio System. City shall have no right to grant sublicenses.

9.2.4 Software is Proprietary to Contractor

(a) Contractor warrants that it has the title to and/or authority to grant said license(s) and sublicenses(s) of the Software to City.

(b) Notwithstanding anything to the contrary contained in this Agreement, it is understood that City receives no title or ownership rights to Software that Contractor provides City under this Agreement, and all such rights shall remain with Contractor or its suppliers.

(c) City agrees that the Software provided to it by Contractor under this Agreement shall, as between the Parties, be treated as proprietary and a trade secret of Contractor or its suppliers and be subject to the provisions of Article 13 (“Data and Security”).

9.2.5 Restrictions on Use. City is authorized to use the Software only for City’s municipal purposes. City agrees that it will, through its best efforts, not use or permit the Software to be used in any manner, whether directly or indirectly, that would enable any other person or entity not authorized by this Agreement, to use the Software.

9.2.6 Disaster Recovery Copy. For the purpose of any bona fide City disaster recovery plan or with respect to the use of computer software in its municipal operations, City may make one copy of the Software for archival purposes and use such archival copy to restore use of the Software on a site owned or controlled by City. The use of such archival copy shall be limited to (1) the purpose of conducting limited testing of the disaster recovery plan’s procedures and effectiveness and (2) during any period subsequent to the occurrence of an actual disaster during which City cannot operate the Software on the existing site.

9.2.7 Transfer of Products. City may move the Software and supporting materials to another City site.

9.2.8 Documentation. Contractor shall provide the SMFTA with a digital copy of the Documentation for all Software it provides the SFMTA under this Agreement. Contractor grants to City permission to duplicate all printed Documentation for City’s municipal use.

9.2.9 Proprietary Markings. City agrees not to remove or destroy any proprietary markings or proprietary legends placed upon or contained within the Software or any related materials or Documentation.

9.2.10 Authorized Modification. City shall also be permitted to develop, use and modify Application Program Interfaces (“APIs”), macros and user interfaces. For purposes of this Agreement, such development shall be deemed an authorized modification. Contractor shall make no claim under this Agreement to ownership of any APIs, macros or other interfaces developed by or at the direction of City.

9.2.11 Third-Party Programs. Contractor has no general objection to City’s use of third-party programs in conjunction with the Software licensed under this Agreement. Contractor recognizes that City has and will license third party programs that City will use with Contractor’s products. Based on information provided to Contractor as to the Effective Date,

Contractor agrees that such use does not constitute an unauthorized modification or violate the licenses granted under this Agreement.

9.2.12 Delivery. Contractor shall deliver one copy of each of the Software products (including Updates) in computer readable form, as provided in Appendix A.

9.2.13 Installation. The SFMTA will install the Software, except when SFMTA requests Contractor to perform installation as part of Services.

9.2.14 Risk of Loss. Contractor shall replace any Software provided under this Agreement if any of the Software are lost or damaged during shipment or before installation is completed, at no additional charge to City.

9.2.15 Prohibited Use. The City shall not:

(a) make any copies of Software provided under this Agreement or parts thereof, except for archival back up purposes and when making copies as permitted herein, shall transfer to the copy/copies any copyright or proprietary legends or other marking on said Software; or

(b) use said Software for any other purpose than permitted in this Section; or

(c) translate, reverse engineer, adapt, arrange or error-correct or make any other alterations to said Software.

9.2.16 Survival. The obligations of the City under this Section shall survive the termination or expiration of this Agreement.

9.2.17 Contractor's Default. Failure or refusal of Contractor to perform or do any act herein required shall constitute a default. In the event of any default, in addition to any other remedy available to City, this Contract may be terminated by City upon ten Days written notice. Such termination does not waive any other legal remedies available to City.

9.2.18 Warranties: Right to Grant License. Contractor hereby warrants that it has title to and/or the authority to grant a license of the Software to City.

9.2.19 Warranties: Conformity to Specifications. Contractor warrants that when the Software specified and all updates and improvements to the Software that Contractor provides under this Agreement will be free from defects as to design, material, and workmanship and will perform in accordance with Contractor's published specifications.

9.2.20 Discontinuance of Services. Contractor agrees that in the event it ceases to sell CAD/AVL systems for transit applications, or otherwise ceases to market and/or provide proprietary Software, equipment or maintenance Services for the CAD/AVL System, and there is no successor in interest by merger, operation of law, assignment, purchase, or otherwise, Contractor will provide City, without charge, one (1) copy of the then-current Source Code for all of the programs and all supporting Documentation for the Software then operating and

installed at City's locations. If City should obtain the Source Code and the Documentation pursuant to this section, the only use made of the Source Code and the Documentation will be for the SFMTA's maintenance of the System. Contractor shall also make available for City to purchase at reasonable commercial rates all proprietary equipment that SFMTA deems is necessary for the Agency to continue to operate the System for a period of three years, to provide the SFMTA sufficient time to budget, plan, and acquire a replacement to the System.

9.2.21 License of Documentation. Contractor shall supply Documentation to City for Software that Contractor provides to SFMTA under this Agreement. City shall have the right to use the Documentation for the operation and maintenance of the Radio System. City may make limited copies of the Documentation to the extent necessary to maintain one (1) archive version and as required to train its employees in the operation and maintenance of the Radio System provided always that all copyright, confidentiality or proprietary legends or other markings shall be transposed onto such permitted copies. The Documentation and all permitted copies thereof shall at all times be treated as proprietary and a trade secret of Contractor or its suppliers and be subject to the provisions of this Agreement for Confidential Information.

Article 10 Additional Requirements Incorporated by Reference

10.1 Laws Incorporated by Reference. The full text of the laws listed in this Article 10, including enforcement and penalty provisions, are incorporated by reference into this Agreement. The full text of the San Francisco Municipal Code provisions incorporated by reference in this Article and elsewhere in the Agreement (Mandatory City Requirements) are available at http://www.amlegal.com/codes/client/san-francisco_ca.

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

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

10.4 Consideration of Salary History. Contractor shall comply with San Francisco Labor and Employment Code Article 141, the Consideration of Salary History Ordinance or "Pay Parity Act." Contractor is prohibited from considering current or past salary of an applicant in determining whether to hire the applicant or what salary to offer the applicant to the extent that such applicant is applying for employment to be performed on this Agreement or in furtherance of this Agreement, and whose application, in whole or part, will be solicited,

received, processed or considered, whether or not through an interview, in the City or on City property. The ordinance also prohibits employers from (a) asking such applicants about their current or past salary or (b) disclosing a current or former employee's salary history without that employee's authorization unless the salary history is publicly available. Contractor is subject to the enforcement and penalty provisions in Article 141. Information about and the text of San Francisco Labor and Employment Code Article 141 is available on the web at <https://sfgov.org/olse/consideration-salary-history>. Contractor is required to comply with all of the applicable provisions of Article 141, irrespective of the listing of obligations in this Section.

10.5 Nondiscrimination Requirements

10.5.1 Non Discrimination in Contracts. Contractor shall comply with the provisions of San Francisco Labor and Employment Code Article 131 and 132. Contractor shall incorporate by reference in all subcontracts the provisions of those Articles and shall require all subcontractors to comply with such provisions. Contractor is subject to the enforcement and penalty provisions in those Articles.

10.5.2 Nondiscrimination in the Provision of Employee Benefits. San Francisco Labor and Employment Code Article 131.2. Contractor does not as of the date of this Agreement, and will not during the term of this Agreement, in any of its operations in San Francisco, on real property owned by San Francisco, or where work is being performed for the City elsewhere in the United States, discriminate in the provision of employee benefits between employees with domestic partners and employees with spouses and/or between the domestic partners and spouses of such employees, subject to the conditions set forth in Article 131.2.

10.6 Local Business Enterprise and Non-Discrimination in Contracting Ordinance. Contractor shall comply with all applicable provisions of Chapter 14B (LBE Ordinance). Contractor is subject to the enforcement and penalty provisions in Chapter 14B.

10.7 Minimum Compensation Ordinance. Contractor shall pay covered employees no less than the minimum compensation required by San Francisco Labor and Employment Code Article 111, including a minimum hourly gross compensation, compensated time off, and uncompensated time off. Contractor is subject to the enforcement and penalty provisions in Article 111. Information about and the text of Article 111 is available on the web at <http://sfgov.org/olse/mco>. Contractor is required to comply with all of the applicable provisions of 12P, irrespective of the listing of obligations in this Section. By signing and executing this Agreement, Contractor certifies that it complies with Article 111.

10.8 Health Care Accountability Ordinance. Contractor shall comply with the requirements of San Francisco Labor and Employment Code Article 121. For each Covered Employee, Contractor shall provide the appropriate health benefit set forth in Article 121. If Contractor chooses to offer the health plan option, such health plan shall meet the minimum standards set forth by the San Francisco Health Commission. Information about and the text of Article 121, as well as the Health Commission's minimum standards, is available on the web at

<http://sfgov.org/olse/hcao>. Contractor is subject to the enforcement and penalty provisions in Article 121. Any Subcontract entered into by Contractor shall require any Subcontractor with 20 or more employees to comply with the requirements of the HCAO and shall contain contractual obligations substantially the same as those set forth in this Section 10.8.

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

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

Contractor agrees in the performance of this Agreement to maintain a drug-free workplace by notifying employees that unlawful drug use is prohibited and specifying what actions will be taken against employees for violations; establishing an on-going drug-free awareness program that includes employee notification and, as appropriate, rehabilitation. Contractor can comply with this requirement by implementing a drug-free workplace program that complies with the Federal Drug-Free Workplace Act of 1988 (41 U.S.C. § 701) and the California Drug-Free Workplace Act of 1990, Cal. Gov. Code, § 8350 et seq.

10.11 Limitations on Contributions. By executing this Agreement, Contractor acknowledges its obligations under Section 1.126 of the City's Campaign and Governmental Conduct Code, which prohibits any person who contracts with, or is seeking a contract with, any department of the City for the rendition of personal services, for the furnishing of any material, supplies or equipment, for the sale or lease of any land or building, for a grant, loan or loan guarantee, or for a development agreement, from making any campaign contribution to (a) a City elected official if the contract must be approved by that official, a board on which that official serves, or the board of a state agency on which an appointee of that official serves, (c) a candidate for that City elective office, or (b) a committee controlled by such elected official or a candidate for that office, at any time from the submission of a proposal for the contract until the later of either the termination of negotiations for such contract or twelve months after the date the City approves the contract. The prohibition on contributions applies to each prospective party to the contract; each member of Contractor's board of directors; Contractor's chairperson, chief executive officer, chief financial officer and chief operating officer; any person with an

ownership interest of more than 10% in Contractor; any subcontractor listed in the bid or contract; and any committee that is sponsored or controlled by Contractor. Contractor certifies that it has informed each such person of the limitation on contributions imposed by Section 1.126 by the time it submitted a proposal for the contract, and has provided the names of the persons required to be informed to the City department with whom it is contracting.

10.12 Consideration of Criminal History in Hiring and Employment Decisions

10.12.1 Contractor agrees to comply fully with and be bound by all of the provisions of San Francisco Labor and Employment Code Article 142 (Article 142) (City Contractor/Subcontractor Consideration of Criminal History in Hiring and Employment Decisions), including the remedies provided, and implementing regulations, as may be amended from time to time. The provisions of Article 142 are incorporated by reference and made a part of this Agreement as though fully set forth herein. The text of Article 142 is available on the web at <http://sfgov.org/olse/fco>. Contractor is required to comply with all of the applicable provisions of Article 142, irrespective of the listing of obligations in this Section. Capitalized terms used in this Section and not defined in this Agreement shall have the meanings assigned to such terms in Article 142.

10.12.2 The requirements of Article 142 shall only apply to a Contractor's or subcontractor's operations to the extent those operations are in furtherance of the performance of this Agreement, shall apply only to applicants and employees who would be or are performing work in furtherance of this Agreement, and shall apply when the physical location of the employment or prospective employment of an individual is wholly or substantially within the City of San Francisco. Article 142 shall not apply when the application in a particular context would conflict with federal or state law or with a requirement of a government agency implementing federal or state law.

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

Article 11 General Provisions

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

To City: David Rojas
Project Manager II
San Francisco Municipal Transportation Agency
1 South Van Ness, 3rd Floor
San Francisco, CA 94103
david.rojas@sfmta.com

To Contractor: John Fischer
Director, Account Management
Conduent Transport Solutions, Inc.
7160 Riverwood Drive, Columbia, Maryland 21046
john.fischer@conduent.com

Any notice of default or data breach must be sent by certified mail or other trackable written communication, and also by e-mail, with the sender using the receipt notice feature. Either Party may change the address to which notice is to be sent by giving written notice thereof to the other Party at least 10 Days prior to the effective date of such change. If email notification is used, the sender must specify a receipt notice.

11.2 Compliance with Laws Requiring Access for People with Disabilities .

Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to people with disabilities. Contractor shall provide the services specified in this Agreement in a manner that complies with the ADA and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against people with disabilities in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns will constitute a material breach of this Agreement.

11.3 Incorporation of Recitals. The Recitals are incorporated into and made part of this Agreement.

11.4 Sunshine Ordinance. Contractor acknowledges that this Agreement and all records related to its formation, Contractor's performance of Services, and City's payment are subject to the California Public Records Act, (California Government Code §7920 et. seq.), and the San Francisco Sunshine Ordinance, (San Francisco Administrative Code Chapter 67). Such records are subject to public inspection and copying unless exempt from disclosure under federal, state or local law.

11.5 Modification of this Agreement. This Agreement may not be modified, nor may compliance with any of its terms be waived, except as noted in Section 11.1 (Notices to the Parties) regarding change in personnel or place, and except by written instrument executed and approved as required under City law and under the policy of the SFMTA Board of Directors. Contractor shall cooperate with the SFMTA to submit to the CCO any amendment, modification, supplement or change order that would result in a cumulative increase of the original amount of this Agreement by more than 20%, and then for any subsequent amendment, modification,

supplement, or change order that would result in a cumulative increase of the last CCO approved value by more than 20%.

11.6 Dispute Resolution Procedure

11.6.1 Negotiation; Alternative Dispute Resolution. The Parties will attempt in good faith to resolve any dispute or controversy arising out of or relating to the performance of services under this Agreement. If the Parties are unable to resolve the dispute, then, pursuant to San Francisco Administrative Code Section 21.36, Contractor may submit to the Contract Administrator a written request for administrative review and documentation of the Contractor's claim(s). Upon such request, the Contract Administrator shall promptly issue an administrative decision in writing, stating the reasons for the action taken and informing the Contractor of its right to judicial review. If agreed by both Parties in writing, disputes may be resolved by a mutually agreed-upon alternative dispute resolution process. If the Parties do not mutually agree to an alternative dispute resolution process or such efforts do not resolve the dispute, then either Party may pursue any remedy available under California law. The status of any dispute or controversy notwithstanding, Contractor shall proceed diligently with the performance of its obligations under this Agreement in accordance with the Agreement and the written directions of the City. Neither Party will be entitled to legal fees or costs for matters resolved under this Section.

11.6.2 Government Code Claim Requirement. No suit for money or damages may be brought against the City until a written claim therefor has been presented to and rejected by the City in conformity with the provisions of San Francisco Administrative Code Chapter 10 and California Government Code Section 900, et seq. Nothing set forth in this Agreement shall operate to toll, waive or excuse Contractor's compliance with the California Government Code Claim requirements set forth in San Francisco Administrative Code Chapter 10 and California Government Code Section 900, et seq.

11.7 Agreement Made in California; Venue. The formation, interpretation and performance of this Agreement shall be governed by the laws of the State of California. Venue for all litigation relative to the formation, interpretation and performance of this Agreement shall be in San Francisco, California.

11.8 Construction. All paragraph captions are for reference only and shall not be considered in construing this Agreement.

11.9 Entire Agreement. This Contract sets forth the entire agreement between the Parties as to the Services described herein, and except as expressly stated herein supersedes all other oral or written provisions and agreements concerning the Services to be provided under this Agreement. This Agreement may be modified only as provided in Section 11.5 (Modification of this Agreement). This Agreement does not modify the Parties agreement, "As-Needed

CAD/AVL Professional Work,” SFMTA Contract No. 2018-49, dated April 10, 2019, or any surviving obligations and rights under the Radio System Contract (SFMTA Contract 1240).

11.10 Compliance with Laws. Contractor shall keep itself fully informed of the City’s Charter, codes, ordinances and duly adopted rules and regulations of the City and of all state, and federal laws in any manner affecting the performance of this Agreement, and must at all times comply with such local codes, ordinances, and regulations and all applicable laws as they may be amended from time to time.

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

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

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

11.14 Force Majeure. Dates or times by which either Party is required to perform under this Agreement, excepting the payment of any fees or charges due hereunder, shall be postponed to the extent that any party is prevented from meeting them by causes beyond its reasonable control that the party could not have reasonably anticipated and avoided or otherwise mitigated to avoid delay (Unavoidable Delay). (See Section 11.15.4.)

11.15 Delays and Extensions of Time.

11.15.1 Time of the Essence. Contractor agrees that, with respect to Contractor’s performance of Contractor’s covenants, conditions, and obligations under this Agreement, time is of the essence.

11.15.2 Notice to Proceed. Authorization for Contractor to proceed with performance of the Services will be provided through the SFMTA's issuance of Notice to Proceed. The SFMTA anticipates issuance Notice to Proceed on the Effective Date.

11.15.3 Schedule. As a material consideration for entering into this Agreement, Contractor hereby commits and the SFMTA is relying on Contractor's commitment, to perform the Services in accordance with the Schedule attached hereto as Appendix E (Project Schedule). The Parties shall use the Schedule for planning and monitoring the progress of Contractor's work under this Agreement.

11.15.4 Unavoidable Delays. The term "Unavoidable Delay" shall mean an interruption of the Work beyond the control of Contractor that could not have been avoided by Contractor's exercising due care, prudence, foresight, and diligence. If Contractor claims that its performance of the Services has been delayed due to a Force Majeure event or other Unavoidable Delay, Contractor shall demonstrate that the Unavoidable Delay actually extends the completion date or Milestone. Delays attributable to and within the control of a Subconsultant, Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

(a) Contractor will be entitled to a non-compensable extension of the time to perform delayed Services only for the following types of Force Majeure or Unavoidable Delay: acts of God; acts of the public enemy; adverse weather conditions; fires; floods; windstorms; hurricanes, tornadoes; earthquakes; wars; riots; insurrections; epidemics; quarantine restrictions; strikes; lockouts; sit-downs; slowdowns; other labor trouble; labor shortages; inability of Contractor to procure labor or materials that are not caused by Contractor's lack of due diligence and planning; material shortages; fuel shortages; freight embargoes; accidents; acts of a government agency; priorities or privileges established for the manufacture, assembly or allotment of materials by order, decree, or otherwise of the United States or by any department, bureau, commission, committee, agent or administrator of any legally constituted public authority; and inability to procure or failure of public utility service.

(b) Whenever Contractor has knowledge that any actual or potential labor dispute is delaying or is threatening to delay the timely performance of the Services, Contractor shall immediately give written notice thereof, including all relevant information with respect thereto, to City.

(c) In addition, Contractor shall take all appropriate measures to eliminate or minimize the effect of such labor dispute on the current, City-approved progress schedule, including but not limited to such measures as: promptly seeking appropriate injunctive relief; filing appropriate charges with the National Labor Relations Board under the applicable provisions of the Labor Management Relations Act of 1947, as amended; filing appropriate damage actions; taking such measures as establishing a reserved gate, as appropriate; if reasonably feasible, seeking other sources of supply or service; or any other measures that may be appropriately utilized as deemed by City to limit or eliminate the effect of the labor dispute on

the Work. To the extent Contractor fails to initiate appropriate measures, it is not entitled to an extension of Contract Time. In addition, any delay impact caused by said failure on the progress schedule will be considered a Contractor-caused delay under any and all applicable provisions of the Agreement.

11.15.5 Avoidable Delays. The term "Avoidable Delay" shall include but is not limited to the following:

(a) Any delay which could have been avoided by the exercise of due care, prudence, foresight and diligence on the part of Contractor including rescheduling the Work or organizing the Work (including procuring materials and Software) so that the critical path is not impacted by the delay or such impacts are minimized;

(b) Any delay in the performance of parts of the Work, which may in itself be Unavoidable, but which does not necessarily prevent or delay the performance of other parts of the Work, nor delay the specified completion date.

11.15.6 Notice of Delay

(a) Contractor shall promptly notify City in writing of all anticipated delays in the performance of the Work and, in any event, promptly upon the occurrence of a delay. City may take steps to prevent the occurrence or continuance of the delay, and City may determine to what extent any Milestone is delayed thereby.

(b) Said notice shall constitute an application for an extension of time only if it requests such time extension in writing that sets forth Contractor's estimate of the additional time required together with a full recital of the causes of Unavoidable Delays relied upon, Contractor must submit that notice to City within seven (7) Days of the event which Contractor contends affected the performance of the Work.

(c) City's determination of whether an extension of time will be granted will be based on Contractor's demonstration to City's satisfaction that such Unavoidable Delays will extend Contractor's current critical path on the current, City-approved updated progress schedule or require the formulation of a new extended critical path.

(d) If Contractor does not submit a timely Notice of Potential Contract Claim, Contractor thereby admits the occurrence had no effect on the length of its duration of Work, waives any Claim based on the occurrence, and stipulates that no extension of time is necessary. Contractor understands and agrees that in failing to provide timely notice, no extension of time or adjustment of the Contract Amount will be granted by City.

11.15.7 Extensions of Time

(a) In the event that SFMTA deems it necessary to extend the time for completion of the Services to be done under this Agreement beyond the schedule for delivery of Services agreed by the parties, such extensions shall in no way release or reduce any guarantees

or warranties given by Contractor under the provisions of the Agreement and shall extend said warranties so that City enjoys the full benefit of them as if no delay had occurred.

(b) The length of any extension of time shall be limited to the extent that the commencement, performance and completion of the Services are delayed by the event as agreed by City.

(c) Granting of an extension of time because of Unavoidable Delays shall in no way operate as a waiver on the part of City of the right to collect damages or to pursue other rights and interests to which City is entitled, if applicable.

11.16 Change Orders

11.16.1 City Proposed Change Order. The SFMTA may at any time, by written order submit a Change Order to Contractor. Within 10 business days of receiving a proposed Change Order, Contractor shall submit to the SFMTA Project Manager a written cost estimate, which shall include any adjustments to the cost of the Work, the Schedule, the Statement of Work, the Acceptance criteria, or any other obligations of Contractor, as applicable.

11.16.2 Contractor Proposed Change Order. Contractor may also propose a Change Order involving either additions, deletions, or revisions to the Work, or any obligations imposed upon the Parties under this Agreement. Contractor's proposed Change Order shall be in the form of a Request for Change ("RFC") which shall explain, in writing, Contractor's basis for requesting the Change Order and the impact of the proposed Change Order on the Schedule, the cost of Work, the Agreement documents and Deliverables, and any other interdependent Work, including but not limited to, the Acceptance criteria, training, documentation, performance, resources, functional requirements, and technical requirements, as provided in this Agreement.

11.16.3 Any Change Order requiring a Project price adjustment that results in an overall increase to the not to exceed compensation (Section 3.3.1), shall be agreed to in writing by the Parties and executed in the same manner as this Agreement pursuant to Section 11.5 (Modification of this Agreement).

11.16.4 All Change Orders must be approved, in writing, by the SFMTA Project Manager. Contractor shall not proceed with any work contemplated in any Change Order until it receives written notification to commence such work from the SFMTA Project Manager.

11.16.5 The SFMTA shall have authority to order minor changes in the Work not involving either an adjustment in the total contract sum or an extension of the time for completion of the Work. The SFMTA Project Manager may waive a variation in the Work if, in their opinion, such variation does not materially change the Work or the Software's performance.

Article 12 SFMTA Specific Terms

12.1 Large Vehicle Driver Safety Training Requirements

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

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

Article 13 Data and Security

13.1 Nondisclosure of Private, Proprietary or Confidential Information

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

13.1.2 Confidential Information . In the performance of Services, Contractor may have access to, or collect on City’s behalf, City’s proprietary or Confidential Information, the disclosure of which to third parties may damage City. If City discloses proprietary or Confidential Information to Contractor, or Contractor collects such information on City’s behalf, such information must be held by Contractor in confidence and used only in performing the Agreement. Contractor shall exercise the same standard of care to protect such information as a reasonably prudent contractor would use to protect its own proprietary or Confidential Information.

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

13.3 Management of City Data and Confidential Information

13.3.1 Use of City Data and Confidential Information. Contractor agrees to hold City Data received from, or collected on behalf, of the City, in strictest confidence. Contractor shall not use or disclose City Data except as permitted or required by the Agreement or as otherwise authorized in writing by the City. Any work using, or sharing or storage of, City Data outside the United States is subject to prior written authorization by the City. Access to City Data must be strictly controlled and limited to Contractor's staff assigned to this project on a need-to-know basis only. Contractor is provided a limited non-exclusive license to use the City Data solely for performing its obligations under the Agreement and not for Contractor's own purposes or later use. Nothing herein shall be construed to confer any license or right to the City Data or Confidential Information, by implication, estoppel or otherwise, under copyright or other intellectual property rights, to any third-party. Unauthorized use of City Data by Contractor, subcontractors, or other third parties is prohibited. For purpose of this requirement, the phrase "unauthorized use" means the data mining or processing of data, stored or transmitted by the service, for commercial purposes, advertising or advertising-related purposes, or for any purpose other than security or service delivery analysis that is not explicitly authorized.

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

Article 14 MacBride Principles - Northern Ireland

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

Article 15 Included Appendices

The appended documents listed below are incorporated to this Agreement:

Appendix A – Scope of Work

A-1: Project Description

A-2: Project Management Requirements

Appendix B – Functional Requirements

Appendix C – Technical Requirements

Appendix D – Milestone Payment Schedule

Appendix E – Project Schedule

Signatures on are the following page.

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

| | |
|---|---|
| <p>CITY</p> <p>San Francisco Municipal Transportation Agency</p> <hr/> <p>Jeffrey P. Tumlin Director of Transportation</p> <p>Authorized By:</p> <p>Municipal Transportation Agency Board of Directors</p> <p>Resolution No: _____</p> <p>Adopted: _____</p> <p>Attest: _____ Secretary to the Board</p> <p>Approved as to Form:</p> <p>David Chiu City Attorney</p> <p>By: _____ Annie Smiddy Deputy City Attorney</p> | <p>CONTRACTOR</p> <p>Conduent Transport Solutions, Inc.</p> <hr/> <p>Jean-Charles Zaia Vice President, General Manager 12410 Milestone Center Drive Suite 500 Germantown, MD 20876</p> <p><u>Acknowledgement of Large Vehicle Driver Safety Training Requirements:</u></p> <p>By signing this Agreement, Contractor acknowledges that it has read and understands Section 12.1: Large Vehicle Driver Safety Training Requirements.</p> <p>City Supplier Number: 0000025042</p> |
|---|---|

Appendix A Scope of Work

Appendix A-1 Project Description

1. Introduction

This SOW outlines the responsibilities, Deliverables and scope of work to be supplied by Conduent to produce the specified Upgrades to the existing Conduent CAD/AVL environment used by SFMTA. Conduent responsibilities include performing project management using agreed processes and procedures to ensure efficient and successful delivery of the Upgrades and associated features. The Deliverables include modified IVU (Integrated Vehicle Unit) firmware, updated application server and client software, as well as database enhancements and new/updated integration that provides the new features and functionality that satisfy the technical and functional requirements as defined here.

Conduent shall capture the Project Management Provisions, Functional and Technical Requirements, and other specifications that are material to the new and enhanced features within a Requirements Traceability Verification Matrix (RTVM). The RTVM shall be the definitive technical reference used for testing and verification to ensure that the project Deliverables are compliant.

During production of the project deliverables, Conduent shall perform Software design and development, Software installation and configuration, as well as Systems and Software testing and verification. Conduent shall provide test plans, test procedures and reports as specified in the Project Management Provisions.

Support for integration of Conduent Software applications, application environment and databases with third party Software interfaces and SFMTA infrastructure shall be included with the services furnished by Conduent. Accordingly, Conduent shall provide support for Software installation and commissioning within SFMTA's next generation virtualized server environment, which is the target production server infrastructure for the application Software and databases delivered by Conduent. The Software, applications, integrations, functions and features delivered in each phase of this project shall be sufficiently performant, stable and reliable for their intended use by SFMTA.

2. Technical and Functional Scope Summary

Conduent shall deliver the following overview of features and functionality, as with specific requirements described in detailed in the Appendices:

| | Project Feature or functionality | Current functionality | Project Scope |
|----|--|---|--|
| 1. | Terminal departure alarm triggered to maintain headway | Vehicles operators on headway based routes have limited information on when to depart a terminal. | Vehicles operators on headway based routes have a countdown timer and alarm indicating the time to depart a terminal. |
| 2. | Virtualization of CAD/AVL server infrastructure and updated database | Fixed-end CAD/AVL operating systems are obsolete and installed directly on server hardware. | Current operating systems are virtualized and installed on top of virtual machine manager (hypervisor) to achieve modern and maintainable configuration. System database is updated to support new features and functionality. |
| 3. | Deployment of latest version of OrbCAD | OrbCAD application runs on top of an existing obsolete operating system and database. | New version of OrbCAD application re-compiled for compatibility with modern operating system and updated database and deployed to new infrastructure. |
| 4. | Bulk Data Transfer over cellular | Large files such as software updates, schedule data, passenger count log, event logs, automatic announcement data, destination sign data are sent to vehicles using Wi-Fi data connection at vehicle yards. | Large files sent using a high bandwidth data link from commercial wireless communications provider, not L3Harris radio. Wi-Fi to be removed. |
| 5. | Bulk Data Transfer Monitoring | No visibility into status of bulk data transfer to vehicle. | Tools to monitor status of bulk data transfer. |
| 6. | All CAD/AVL Data over cellular w/L3Harris voice | Data such as driver log on status, talk status, driver text messaging, emergency alarms, vehicle location, and current passenger load, are sent over existing low bandwidth L3Harris data communications system. Voice communications are over L3Harris radio system. | More frequent data sent using a high bandwidth data link from commercial wireless communications provider, not L3Harris radio. Voice communications remain on L3Harris radio system. |

| | Project Feature or functionality | Current functionality | Project Scope |
|-----|---|---|--|
| 7. | Schedule Management App enhancements | Current App was delivered to previous spec but needs to be updated to meet different SFMTA operational policies. | The schedule management app will be enhanced per the functional requirements. |
| 8. | IVU4000 Smart Polling | Vehicle location for most revenue vehicles is sent to fixed end every 60 seconds. | Vehicle location polling rate can be varied depending on operational scenario. |
| 9. | GTFS Static File Changes (Multiple service IDs) | GTFS files, used to interface schedule data with third parties, are generated inefficiently using one service ID per day, leading to large file sizes and compatibility problems. | The GTFS files generated support multiple service IDs per day allowing for smaller files and better third party compatibility. |
| 10. | Updated service change features and data feed (see section 3) | Limited tools to manage planned and unplanned service changes and generate data for third parties. | Updated and expanded toolset to manage service changes and generate more data for third parties. |
| 11. | Deployment of Fleet Management System (FMS) | Legacy OrbCAD Windows application used by TMC controllers to manage service. OrbCAD no longer under active development. | Web-based application under active support by the vendor. To be delivered in later phase shown in schedule after deployment of updated OrbCAD. |
| 12. | Over-the-air Paddle Updates | Sudden service changes are not able to be communicated to vehicle operators due limited data bandwidth of the L3Harris radio system. | Service change data propagated in real-time to operators over a data link from commercial wireless provider. |

3. Summary of Service Change Features

The following table lists types of service changes and whether they will be supported in the FMS GUI Tool, GTFS static, Standard GTFS Real Time Data Feed, and Trip Modification Real Time Data Feed:

| Req. Reference | Functionality* | FMS GUI tool | GTFS Static | Standard GTFS Real Time Data Feed | Trip Modification Real Time Data Feed |
|----------------|----------------------------|--------------|--------------------------|-----------------------------------|---------------------------------------|
| FP-1.1 | Adjust headway for a route | Yes | Not applicable to static | Yes | No |

| | | | | | |
|---------|---|----------------|--------------------------|-----|-----|
| FP-1.5 | Vehicle terminal departure event, headway route | Not applicable | Not applicable to static | Yes | No |
| FP-1.5 | Vehicle terminal departure event, scheduled route | Not applicable | Not applicable to static | Yes | No |
| FP-2.1 | Define a route detour via GUI | Yes | Yes | Yes | Yes |
| FP-2.2 | Suspend & move stops | Yes | Yes | Yes | Yes |
| FP-2.3 | Bus substitution for rail | Yes | Yes | Yes | Yes |
| FP-2.6 | Add trips | Yes | Yes | Yes | No |
| FP-2.6 | Remove trips | Yes | Yes | Yes | No |
| FP-2.7 | Add blocks | Yes | Yes | Yes | No |
| FP-2.8 | Remove blocks | Yes | Yes | Yes | No |
| FP-2.11 | Shift Trip for a vehicle | Yes | Not applicable to static | Yes | No |
| FP-2.12 | Skip stop on current trip | Yes | Not applicable to static | Yes | No |
| FP-2.13 | <i>Individual vehicle</i> short turn/early turnback | Yes | Not applicable to static | Yes | No |
| FP-2.14 | Custom layover, schedule based vehicle | Yes | Not applicable to static | Yes | No |
| FP-2.14 | Custom layover, headway based vehicle | Yes | Not applicable to static | Yes | No |

* As functionality pertains to existing headway logic, not active headway management.

4. Project Phases

The project will be broken into 4 Deliverable phases. Each phase will have:

- Formal Design Review/FDR (Except phase 1)
- Engineering and Development/Coding (Internal to Conduent)
- System Testing/Regression Testing (Internal to Conduent)
- Factory Acceptance Testing/FAT (SFMTA Involved)
- Field Testing or On-Site Testing (SFMTA Involved)
- Cutover or Deployment (SFMTA Involved)

In order to maintain an aggressive delivery schedule, Phase 1 will start immediately upon NTP and will have a requirements review, but no formal design review (FDR).

The phases will be broken down as so:

| Phase | Scope |
|-------|---|
| 1 | Headway Pullout Alarm/Terminal Departure in existing 13.72 build |
| 2 | Merge Headway into new build OrbCAD Upgrade, Virtualization, ArcGIS Update, & Test System GTFS Static File Changes (Multiple service IDs, export w/different start date) GTFS Static File Changes (new fields in trips.txt) Remove blocks from GTFS Static export. |
| 3 | Bulk Data Transfer Over Cellular & Cellular Data w/L3Harris Voice, IVU-4000 Smart Polling Unscheduled Route/Block Enhancements Items 1 and 2 (i.e., Schedule Mgmt App Updates) & "Unsched Route/Block Enhancements Items 3 to 11 (i.e., Sched Mgmt App Updates)" Color coding of vehicle RSA status and headway status. Bulk Data Transfer (BDT) monitoring Include reliefs on blocks created by Sched Mgmt App. GTFS Real Time Trip Modifications modifying pattern of existing route. |
| 4 | FMS Upgrade, OTA Paddle, Incident form, FMS color font customization. Headway monitoring tool route direction reflect US right-side driving. FMS paddle in Schedule Viewer format. Stop relocation Add Trips: Block start/end times are updated automatically. Change can apply to current day or multiple days. Schedule delta on a route (i.e., Shift Trips) with OTA paddle. Early turnback at a stop (instead of timepoint). GTFS Real Time Trip Modifications via detour GUI. Custom layover time for a trip on headway based route |

5. Requirements, Requirements Traceability Matrix Structure, Appendices A, B, & C

All requirements are to be traceable to the requirements traceability matrix where the scope has already been negotiated between Conduent and SFMTA.

If a section says “*N/A - Removed from scope, This section intentionally left blank*” the section was removed but kept for historical purposes to show the requirement numbers.

The RTM is broken down into 3 Appendices:

- Appendix A: Project Description (Appendix A-1) and Project Management Requirements (Appendix A-2) - Processes and deliverables associated with the overall project.
- Appendix B: Functional Requirements - Requirements and features, including those for both OrbCAD/FMS and the Conduent Schedule Management Application.
- Appendix C: Technical Requirements - A detailed list of the technical requirements.

6. Software Maintenance

Conduent will provide maintenance services on the Project in accordance with Section 4.9 of this Agreement at no additional cost to the SFMTA

**Appendix A-2
Project Management Requirements**

| Req ID | Title/Feature | High-Level Requirement | Comment |
|--------|---------------------------------|---|--|
| 1 | Scope Summary | See SOW for updated Scope Summary | |
| 2 | Definitions | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 3 | Not Included | Active Headway Management is not Included | |
| 4 | Response Instructions | N/A - Removed from scope, This section intentionally left blank | |
| 5.1 | High level Requirements | See Appendix B and C for high level functional and technical requirements | |
| 6 | Payment Milestones | See Appendix D | |
| 7.1 | Regular meeting schedule | Conduent to participate in 1 Hour Project Management Meeting every two weeks for 1 hour. | Review actions & issues, new or changed risks, schedule, submittal register, activity past two weeks, planned activity next two weeks. |
| 7.2 | Regular meeting schedule | Conduent to participate in 1 Hour technical meetings as needed and mutually agreed. | Identify new technical issues, review actions. Review bugs. |
| 7.3 | Initial CAB Workshops | Conduent to participate in initial schedule review meeting for up to 2 hours | Vendor review activities, dependencies, and critical path. Provide draft documents a week before |
| 7.4 | Requirements analysis workshops | Conduent to participate in use case analysis as defined in Formal Design Review Process and Schedule | |
| 7.5 | Use case analysis workshops | Conduent to participate in requirements analysis as defined in Formal Design Review Process and Schedule | |
| 8.1 | Submittals | Conduent to provide an initial risk register at kickoff and project schedule. Project submittal register to be maintained throughout project. | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
|--------|----------------------|--|---|
| 8.2 | Submittals | Conduent will do 1 formal design review for each phase of 2, 3, and 4. Phase 1 will only have a 1-2 hour requirements review meeting and no formal design review. There will be no preliminary design review. Conduent will also provide documentation and training on an as needed basis. Documentation will be generic Conduent user manuals not customized for SFMTA operations. IT administration manuals or drawings will be provided for Conduent specific systems only and not SFMTA owned IT equipment or servers. | Each phase will also include a factory acceptance test plan, site test plan, and cutover plan to be provided at FDR. Plans are overview documents. Formal test & cutover procedures for each phase will be provided 3 weeks beforehand per schedule for SFMTA review. |
| 9.1 | Submittal Management | Conduent will maintain a submittal register listing the document name, version, version date, submission date, and review status. | All submittals get 1 review cycle with a maximum of 12 business days. In the even a re-submittal is required both teams need to work to expedite. Re-submittals cannot delay the project schedule. |
| 9.2 | Submittal Management | Conduent will not start work for which submittals are pre-requisite until the submittals are approved by the SFMTA. | |
| 9.3 | Submittal Management | Submittals shall be submitted with SFMTA's submittal control form. | |
| 9.4 | Submittal Management | Where a submittal is substantively acceptable to the SFMTA but requires further clarification or is missing information, the SFMTA may respond to the submittal with an "acceptance with comments," in which case the contractor may proceed with the work of the submittal but shall resubmit the corrected submittal within 5 workdays. | |
| 9.5 | Submittal Management | SFMTA comments and responses to the contractor's submittals shall not constitute a legal Contract Modification or other modification of the Contract | For clarifications on non-contract related requirements or data requests, the RFI |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| | | Documents. The Contract Documents shall only be amended by a properly executed written contract modification. | process will be used to document decisions. Conduent will provide a request for information (RFI) documenting their question in word format and SFMTA will reply, sign, and return. |
| 9.6 | Submittal Management | Filenames for submitted documents shall be in the following format: documentName-documentNumber-documentDate.PDF for clarity. | |
| 9.7 | Submittal Management | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 9.8 | Submittal Management | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 9.9 | Submittal Management | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 10.1 | Schedule Management | Conduent will provide and manage a Microsoft project Schedule. The schedule will contain all Conduent activities and only SFMTA activities linked to the critical path or any other critical items or deliverables. Conduent will only maintain SFMTA items for informational purposes and not manage performance. | Conduent will provide a schedule update once per month at project meeting in PDF and .MPP format. |
| 10.2 | Schedule Management | Conduent will update schedule once a month and explain delays in accompanying narrative that discusses relevant facts and causes of delay and identifies the party responsible for delay. With the SFMTA project manager, develop corrective action plans for each schedule delay. | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 10.3 | Schedule Management | A maximum of twenty (20) workdays' duration shall be given to each CPM activity. An activity that exceeds that threshold shall be broken down in detail so that each detail activity will not exceed the maximum. | |
| 10.4 | Schedule Management | Contractor shall request approval to add any activity not in the activity list or change the activity logic after the schedule is baselined. | |
| 10.5 | Schedule Management | Schedule shall include the following milestones for each "project," which must be accepted and approved by SFMTA: preliminary design, final design, factory test plan, factory test results, site test plan, site test results, cut over plan, observation period, punch list, final acceptance punch list work. | |
| 11.1 | Key Review Schedules | See section 8.2 Submittals | |
| 11.2 | Key Review Schedules | Conduent will comply with existing SFMTA change control processes for any deployments or cutovers. See section 8.2 for submittal review discussion. Conduent will arrange travel to maximize time for testing and troubleshooting while minimizing travel costs | |
| 12.1 | Issue/Decision/Risk Mgmt. | Conduent and SFMTA will manage project issues, their due dates, and responsible parties. Issues are specific tasks required in order to meet the approved schedule, scope, and cost. Review at bi-weekly project meetings. | |
| 12.2 | Issue/Decision/Risk Mgmt. | Change management and key project decisions will be controlled by RFI process. SFMTA to respond within 10 days. See section 9.5 | |
| 12.3 | Issue/Decision/Risk Mgmt. | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 12.4 | Issue/Decision/Risk Mgmt. | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section |

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| | | | intentionally left blank |
| 12.5 | Issue/Decision/Risk Mgmt. | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 12.6 | Issue/Decision/Risk Mgmt. | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 13.1 | Requirements Mgmt. | High level requirements shall be verified and traceable to factory and site test procedures. | |
| 13.2 | Requirements Mgmt. | RTM will not be continually updated once completed during contract process, Conduent will not continually update unless there's a change order or RFI. | |
| 13.3 | Requirements Mgmt. | N/A - Removed from scope, This section intentionally left blank | Repeat of 13.2. |
| 13.4 | Requirements Mgmt. | Changes to requirements shall be approved by SFMTA. | |
| 13.5 | Requirements Mgmt. | High level requirements shall be verified and traceable to factory and site test procedures. | |
| 13.7 | Requirements Mgmt. | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 14.1 | Preliminary Design Review | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 14.2 | Preliminary Design Review | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| 15.1 | Final Design Review | Conduent will do 1 formal design review (FDR) for each phase of 2, 3, and 4. Phase 1 will only have a 1-2 hour requirements review meeting and no formal design review. There will be no preliminary design review. Conduent will also provide documentation and training on an as needed basis. Documentation | Conduent will Identify implementation ready system architecture, outside data interfaces, data interfaces between |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| | | will be generic Conduent user manuals not customized for SFMTA operations. IT administration manuals or drawings will be provided for Conduent specific systems only and not SFMTA owned IT equipment or servers. | subsystems, GUI, and cutover strategy. |
| 15.2 | Final Design Review | Conduent will present final use cases ready for implementation at the appropriate phase FDR | |
| 15.3 | Final Design Review | Conduent will submit factory test plan, site test plan, cut-over plan, updated manuals, updated ICDs, and training plan for review. These will be delivered on a timeline in accordance with the schedule. | Each FDR phase will also include a factory acceptance test plan, site test plan, and cutover plan to be provided at FDR. Plans are overview documents. Formal test & cutover procedures for each phase will be provided 3 weeks beforehand per schedule for SFMTA review. Conduent will also provide these documents for phase 1. |
| 16.1 | Factory Test Plan | Conduent will submit a factory test plan at design review. Plans are overview documents. Formal test & cutover procedures for each phase will be provided 3 weeks beforehand per schedule for SFMTA review. | |
| 16.2 | Factory Test Plan | Where applicable, test procedures shall define test cases and test scripts to be executed during the test, including detailed steps, expected outcomes, sequence, and acceptance criteria. | |
| 16.3 | Factory Test Plan | Where applicable, test procedures will validate system performance under different load conditions, including peak load, stress load, and endurance testing | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 16.4 | Factory Test Plan | Where applicable, test procedures will specify the setup and configuration of the environment, including hardware, software, network infrastructure, and any third-party components required for testing. | |
| 16.5 | Factory Test Plan | Where applicable, test procedures will specify design integration test procedures to validate the interaction and interoperability of system components, including external interfaces and third-party integrations. The external interfaces include, at a minimum, the ATCS, GTFS static, AVL feed, L3Harris radio, and schedule data. | |
| 16.6 | Factory Test Plan | Where applicable, test procedures will specify regression test procedures to ensure that system changes or enhancements do not adversely impact existing functionality. | |
| 16.7 | Factory Test Plan | Where applicable, test procedures will specify user acceptance test procedures for end-users to validate that the system meets their requirements per the use cases. | |
| 16.8 | Factory Test Plan | Where applicable, test procedures will identify test procedures, hours required, equipment, personnel, test procedures, test sequence, and schedule. | |
| 16.9 | Factory Test Plan | Plans are overview documents to be submitted ahead of time. Procedures are formal documents to be written during testing and dry run, then executed in front of SFMTA. | |
| 17.1 | Factory Test | Conduent will execute the factory test per the approved factory test procedure. | |
| 17.2 | Factory Test | Factory test can be witnessed virtually by SFMTA using Teams via webcam and screenshare from vendor's test facility. However Conduent recommends SFMTA come to Conduent Facility as the remote experience will not always show everything as witnessing first hand. | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 17.3 | Factory Test | Factory test shall not begin until factory procedures are accepted by SFMTA. Conduent will be dry-running FAT procedures up until FAT and last minute revisions may be necessary if a discrepancy is found. | |
| 17.4 | Factory Test | Completion of the factory test and approval by SFMTA of test results and corrective actions are prerequisites for site test. | |
| 18.1 | Site Test Plan | Conduent will submit a site test plan at design review. Plans are overview documents. Formal site test & cutover procedures for each phase will be provided 3 weeks beforehand per schedule for SFMTA review. Test procedure names may not be ready during planning. | |
| 18.2 | Site Test Plan | Where applicable, test procedures shall define test cases and test scripts to be executed during the test, including detailed steps, expected outcomes, sequence, and acceptance criteria. | |
| 18.3 | Site Test Plan | Where applicable, test procedures will validate system performance under different load conditions, including peak load, stress load, and endurance testing | |
| 18.4 | Site Test Plan | Where applicable, test procedures will specify the setup and configuration of the environment, including hardware, software, network infrastructure, and any third-party components required for testing. | |
| 18.5 | Site Test Plan | Where applicable, test procedures will specify design integration test procedures to validate the interaction and interoperability of system components, including external interfaces and third-party integrations. The external interfaces include, at a minimum, the ATCS, GTFS static, AVL feed, L3Harris radio, and schedule data. | |
| 18.6 | Site Test Plan | Where applicable, test procedures will specify regression test procedures to | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
|--------|----------------|--|--|
| | | ensure that system changes or enhancements do not adversely impact existing functionality. | |
| 18.7 | Site Test Plan | Where applicable, test procedures will specify user acceptance test procedures for end-users to validate that the system meets their requirements per the use cases. | |
| 18.8 | Site Test Plan | Where applicable, test procedures will identify test procedures, hours required, equipment, personnel, test procedures, test sequence, and schedule. | |
| 18.9 | Site Test Plan | Plans are overview documents to be submitted ahead of time. Procedures are formal documents to be written during testing and dry run, then executed in front of SFMTA. | |
| 19.1 | Site Test | Conduent will execute the site test per the approved site test procedure | |
| 19.2 | Site Test | Test execution shall be witnessed by SFMTA otherwise SFMTA may not accept results. | |
| 19.3 | Site Test | Site test shall not begin until site test procedures are accepted by SFMTA. | |
| 19.4 | Site Test | Completion of the factory test and approval by SFMTA of test results and corrective actions are prerequisites for site test. | Issue priority classifications and response times are defined in the Maintenance Agreement. Medium priority items shall be resolved in an agreed-upon timeline. Low will be put on punch list. |
| 19.5 | Site Test | Provide two on-site engineers with previous experience in at least two installations of similar scope and complexity. | |
| 19.6 | Site Test | In case of a "no-go," define which actions require resolution to achieve a "go" and set a new "go/no-go" date. | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 20.1 | Cutover Plan | Conduent will submit a cutover plan at design review. Plans are overview documents. Formal site test & cutover procedures for each phase will be provided 3 weeks beforehand per schedule for SFMTA review. Test procedure names may not be ready during planning. | |
| 20.2 | Cutover Plan | The cutover procedure shall identify tasks that to be completed before the cutover process can begin, such as performing backups and validating system configurations. | |
| 20.3 | Cutover Plan | The cutover procedure shall specify data migration and transfer processes to ensure that data is migrated accurately and securely from the existing system to the new system. | |
| 20.4 | Cutover Plan | The cutover procedure shall identify each step required to bring the system to its new configuration, and each step required to cut the system back to original configuration at any time after the original cutover. For each step, identify the activity, the amount of time required to perform the activity, person responsible for execution of the activity, downtime, and amount of time required to revert the system to its previous configuration. | |
| 20.5 | Cutover Plan | The cutover procedure shall specify criteria to perform a rollback. | |
| 20.6 | Cutover Plan | The cutover procedure shall identify personnel to perform cut-over. Provide two on-site engineers with previous experience in at two cutovers of similar scope and complexity. | |
| 20.7 | Cutover Plan | The cutover procedure shall identify hours required, locations, equipment, personnel, test procedures, test sequence, and schedule. | |
| 20.8 | Cutover Plan | The cutover procedure shall identify which requirements need to be validated to ensure the system is operating per its | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| | | new configuration and the test procedures used to validate those requirements. | |
| 21.1 | Cutover | Conduent shall execute cutover per the approved cutover procedure | |
| 21.2 | Cutover | The cutover shall not begin until cutover procedure is accepted by SFMTA. | |
| 21.3 | Cutover | Conduent shall in case of a "no-go," define which actions require resolution to achieve a "go" and set a new "go/no-go" date. | |
| 21.4 | Cutover | Conduent shall provide on-site engineers shall be locally available for 1-2 days if needed per the cutover schedule after the cut-over event to address any issues that need immediate escalation. | |
| 22.1 | Observation Period | Thirty calendar day observation period begins once cut over is complete the system must work without interruption. Issue priority classifications and response times are defined in the Maintenance Agreement. Medium priority items shall be resolved in an agreed-upon timeline. Low will be put on punch list. | |
| 22.2 | Observation Period | During the observation period, changes to system hardware or software or system failures will cause the observation period to reset. | |
| 23.1 | Use Cases | Use cases may be reviewed during design but not subject to change unless there is an egregious mistake. The use cases have already been agreed upon between Conduent and SFTMA and are outlined in scope and RTM and considered final requirements. | |
| 23.2 | Use Cases | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 23.3 | Use Cases | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 23.4 | Use Cases | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 23.5 | Use Cases | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 24.1 | Software Issue Management | Conduent and SFMTA will manage Software defect tracking and resolution in a separate Excel document throughout the duration of CAB. | |
| 24.2 | Software Issue Management | Each Software issue shall be managed according to the following criteria: ticket identification number, descriptive title, steps required to reproduce issue, expected correct behavior, observed behavior, name of analyst/engineer, severity, relevant software versions, bug status updated throughout bug resolution lifecycle, description test performed to prove resolution, root cause analysis, and corrective action. | |
| 24.3 | Software Issue Management | Issues/tickets shall remain open until production Software is updated. | |
| 24.4 | Software Issue Management | Tickets related to the scope of the project shall be analyzed and resolved by members of the project team. Critical and High priority issues are to be fixed immediately and they shall not be addressed by Conduent's warranty or product support teams. Issue priority classifications and response times are defined in the Maintenance Agreement. Medium priority items shall be resolved in an agreed-upon timeline. Low will be put on punch list. | |
| 25.1 | Change orders | N/A - Defined in terms. This section intentionally left blank. | |
| 25.2 | Change orders | N/A - Defined in terms. This section intentionally left blank. | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| 25.3 | Change orders | N/A - Defined in terms. This section intentionally left blank. | |
| 25.4 | Change orders | N/A - Defined in terms. This section intentionally left blank. | |
| 25.5 | Change orders | N/A - Defined in terms. This section intentionally left blank. | |
| 25.6 | Change orders | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 26.1 | Training Plan | SFMTA must identify relevant stakeholders involved in the technology system, including end-users or system administrators. | |
| 26.2 | Training Plan | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 26.3 | Training Plan | Conduent will identify training content covering all aspects of the technology system, including overview of the system architecture and components, functionalities and features of the system, best practices for system usage and maintenance, and troubleshooting common issues and errors. | |
| 26.4 | Training Plan | Conduent will provide two four hour training sessions on schedule changes or headway topics SFMTA may want. | |
| 26.5 | Training Plan | The training plan shall provide a training schedule outlining the timing, duration, and location of training sessions. Consider the availability of participants and any scheduling constraints that may impact their ability to attend. | |
| 26.6 | Training Plan | The training plan shall implement mechanisms for assessing participants' learning progress and gathering feedback on the effectiveness of the training program. This may include pre-training assessments, practical assessments to | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| | | evaluate learning outcomes, and surveys or feedback forms | |
| 27.1 | Training | Provide on-site training for SFMTA IT staff on system theory of operation and maintenance of CAD/AVL specific systems (Not IT Training). Training shall occur in a 4-hour session scheduled during normal business hours. | |
| 27.2 | Training | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 27.3 | Training | SFMTA may record the training session. | |
| 27.4 | Training | Training materials shall be approved by SFMTA before scheduling the training. | |
| 27.5 | Training | Training plan submitted at final design review. | |
| 28.1 | Test Documentation | In the test plan, include the following: There shall be a section for each phase of testing (FAT, SAT and Cutover). Plans are only overviews. Conduent will use our standard test procedures. Where possible, the test procedures will have RTM requirements number to identify scope being tested. | |
| 28.2 | Test Documentation | Conduent will use our standard test procedures. Conduent will provide reports to SFMTA for all FAT and SAT activities. | |
| 28.3 | Test Documentation | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 29.1 | Warranty | All IT Hardware and non-CAD systems are to be bought, installed, and warranted by SFMTA. Conduent will provide CAD/AVL SW Warranty in accordance with Sections 4.8 and 4.9 of this Agreement. | |
| 29.2 | Warranty | Software problems or issues discovered shall be addressed as part of warranty, regardless of whether they existed in | |

| Req ID | Title/Feature | High-Level Requirement | Comment |
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| | | system before the commencement of work. | |
| 30.1 | Materials | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 30.2 | Materials | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 31.1 | Schematic Drawings | N/A - Removed from scope. This section intentionally left blank. | N/A - Removed from scope. This section intentionally left blank. |
| 32.1 | Schematic Drawings | Conduent and SFMTA will work together to provide a VLAN spreadsheet. | |

Appendix B Functional Requirements

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
|---------|--------------------|--|---|--|
| FP1.1 | Headway Management | The CAD/AVL system shall provide headway-based service. | The CAD-AVL system is used to adjust the scheduled headway for all vehicles/blocks on a route | <ul style="list-style-type: none"> -The TMC Controller manually changes the scheduled headway for a route using a single interface. The TMC Controller enters start/end times during which changes to routes will be in effect. -The MDT headway status updates to reflect the new headway spacing. Gapping and bunching statuses are generated using the new headway spacing. Scheduled headway value on the MDT will be updated. Terminal departures are calculated using the new headway spacing. Changes to the headway function correctly on the IVU-3100 and IVU-4000. -Changes to headway are archived in a table in the CAD/AVL database. -Changes to the headway are transmitted to prediction systems and trip planners. |
| FP1.2 | Headway Management | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP1.3 | Headway Management | The CAD/AVL system shall provide headway-based service. | The CAD-AVL system provides operators feedback to reduce bunching | -The MDT issues an audible alarm that the operator is too close to their leader, and the graphic on the MDT changes to indicate that the vehicle is bunched. The “bunched” audible alarm can be separately configured from the “gapped” audible alarm. The graphic on the MDT is color-coded based on whether the vehicle is on-headway, bunched, or gapped. The threshold for what constitutes "bunched" is |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
|---------|--------------------|---|---|--|
| | | | | set in relation to the scheduled headway and can be different from the threshold for what constitutes "gapped". -All features function correctly on the IVU-3100 and IVU-4000. |
| FP1.4 | Headway Management | The CAD/AVL system shall provide headway-based service. | The CAD/AVL system provides operators feedback to reduce gapping | -The MDT issues an audible alarm that the operator is too far from their leader, and the graphic on the MDT changes to indicate that the vehicle is gapped. The "gapped" audible alarm can be separately configured from the "bunched" audible alarm. The graphic on the MDT is color-coded based on whether the vehicle is on-headway, bunched, or gapped. The threshold for what constitutes "gapped" is set in relation to the scheduled headway and can be different from the threshold for what constitutes "bunched". -All features function correctly on the IVU-3100 and IVU-4000. |
| FP1.5 | Headway Management | The CAD/AVL system shall provide headway-based service. | The CAD-AVL system provides operators feedback on when to depart from terminals to maintain the scheduled headway | -The CAD-AVL system calculates when the vehicle should depart from the terminal to maintain its headway. Terminal departure will be dynamic to maintain headway. Vehicle departure time is calculated in relation to the scheduled headway and when the vehicle's leader departed from the terminal. Terminal departures are calculated to minimize the change from the underlying base schedule. When the vehicle arrives at the terminal, the MDT shows a countdown to the estimated departure time. Within a certain number of minutes of the departure, the MDT emits an alarm. If changes are made to the trip departure time or to the |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>scheduled headway, the countdown and all notifications change to reflect the new trip start time.</p> <ul style="list-style-type: none"> -Terminal departure times (and changes to terminal departure times) are transmitted to prediction systems and trip planners. -All features function correctly on the IVU-3100 and IVU-4000. |
| FP1.6 | Headway Management | The CAD/AVL system shall provide headway-based service. | The CAD-AVL system provides feedback to controllers when gaps or bunches are emerging on a route | <ul style="list-style-type: none"> -When a vehicle's gap/bunch is longer or shorter than a certain size in minutes, the TMC controller is notified. The TMC controller may manually issue commands via voice or data call to any vehicle on the route to maintain headway, such as holding at stops, running express, running as drop-off only, passing the vehicle's leader, or short turning. Commands from the controller will be sent to the vehicle's MDT and the operator will be notified. All headway commands are accessible via the Performance Queue. -All commands issued by the controller are archived in a table in the CAD/AVL database. -All messages function correctly on the IVU-3100 and IVU-4000. |
| FP1.7 | Headway Management | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
|---------|----------------------|---|---|---|
| FP2.1 | Service Change Tools | The CAD/AVL system shall provide features to manage a route detour. | TMC controller configures detour around street closure or service disruption. | <p>-There is a street closure or other service disruption, either planned or unplanned, and all vehicles on a transit route must take a detour route (re-routed to different streets). The controller uses the CAD-AVL system to input the detour route, including identifying a detour area on the map and adjusting the route around the detour by using waypoints and inserting replacement stops along the detour path. The CAD-AVL system automatically updates trip information like running time. The controller specifies the start/end times of the detour. Detours can be for the current day only or span multiple, future dates. Detours can be terminated before their specified end time. Detours are archived in a table in the CAD-AVL database.</p> <p>-Detour information is transmitted to prediction systems and trip planners regardless of whether the fleet is a mixture of IVU-3100 and IVU-4000 vehicles or not. GTFS-RT TripModification will include the service change information for all days the service change is active. The controller can also initiate a service alert sent via GTFS real time. Planned detours for future days are incorporated into static GTFS files exported from the CAD/AVL system.</p> <p>-The detour information is transmitted to the MDT. All features function correctly on the IVU-3100 and IVU-4000. Dynamic (i.e., graphical) detour applies to FMS and IVU-4000 when installed on the entire fleet. In the interim, while the fleet is a</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
|---------|----------------------|---|--|---|
| | | | | <p>mix of the IVU-3100 and IVU-4000 vehicles, the OrbCAD text based detour that currently exists will be used and no paddle updates will occur. A Store and Forward message containing the detour information will be sent to the MDT on all vehicles currently logged on and future logons for the selected routes for the period the change is active. Paddle information is updated on the IVU-4000 for dynamic detour only.</p> <p>-Detour configurations can be saved and stored in the CAD-AVL for future use.</p> |
| FP2.2 | Service Change Tools | The CAD/AVL system shall provide features to manage a stop closure or relocation. | TMC controller commands alternate stops. | <p>-Transit vehicles are temporarily not able to use a scheduled stop on the route. In a planned or unplanned situation, the controller uses the CAD-AVL system to identify a stop that will be temporarily out-of-service. The controller specify the duration for which that stop will be out-of-service and the route(s) for which it is out of service. If applicable, the controller can identify an alternative stop along the existing route alignment that transit vehicles will use instead until the disruption is resolved. The controller specifies the start/end times of the stop relocation. The stop relocation can be for the current day or span multiple days. The stop relocation can be terminated earlier than the specified end time. The controller may also move the location of an existing stop for some or all routes that it services; in this scenario, the moved stop would keep the same name and public facing stop code</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>from its original location, but the location would be different. A new stop_id will be assigned. A Store and Forward message will be sent to all vehicles currently logged on and future logons for the selected routes for the period the change is active. The controller can also initiate a service alert to be sent out via GTFS real time.</p> <p>-Stop relocations enacted are archived in a table in the CAD/AVL database.</p> <p>-Information is transmitted to prediction systems and trip planners. GTFS-RT TripModification will include the service change information for all days the service change is active. The controller can also initiate a service alert sent via GTFS real time. The change can be incorporated into static GTFS files exported from the CAD/AVL system.</p> <p>-A Store and Forward message containing the stop relocation is transmitted to the MDT on all vehicles currently logged on and future logons for the selected routes for the period the change is active.</p> |
| FP2.3 | Service Change Tools | The CAD/AVL system shall provide features to manage a bus substitution for rail. | TMC controller commands bus substitution for rail. | -There is either a planned or unplanned service disruption to rail, and bus service is substituted for rail. The controller may change the name of the route (example: from "K" to "KBUS"). The controller inputs information about the bus substitution into the CAD-AVL system and specifies start/end times for the bus substitution. The bus substitution can be for the current day or span multiple days. |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>The bus substitution can be terminated earlier than the specified end time.</p> <ul style="list-style-type: none"> -Bus substitutions are archived in a table in the CAD/AVL database. -This information is transmitted to prediction systems and trip planners. GTFS-RT TripModification will include the service change information for all days the service change is active. The change can be incorporated into static GTFS files exported from the CAD/AVL system. -Any changes to the block are transmitted to the MDT and reflected in the paddle on the MDT. All features function correctly on the IVU-3100 and IVU-4000. |
| FP2.4 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP2.5 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP2.6 | Service Change Tools | The CAD/AVL system shall provide features to add or remove trips. | TMC controller adds or removes trips to an existing block. | <ul style="list-style-type: none"> -In either planned or unplanned situations, the controller uses the CAD-AVL system to add or remove trips to an existing block. If adding trips in FMS, the CAD-AVL system automatically calculates travel times for the new trips based on travel times for similar trips and block start/end times are updated automatically. -In FMS, the controller specifies start/end times for the change. The change can be for the current day or for multiple days consisting of |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>the same service type and can be terminated earlier than the specified end time. In OrbCAD, the change is for the current day only.</p> <ul style="list-style-type: none"> -Trip changes are archived in a table in the CAD-AVL database. -Information is transmitted to prediction systems and trip planners. GTFS-RT TripUpdate will include the service change information for each day the service change is active. The change can be incorporated into static GTFS files exported from the CAD-AVL system. -Information is transmitted to the MDT and the paddle on the MDT is updated. All features function correctly on the IVU-3100 and IVU-4000. Operators are notified of the change. For the unplanned case, the controller must request the operator logoff and then logon or send a remote logoff/logon command. |
| FP2.7 | Service Change Tools | The CAD-AVL system shall provide features to add blocks. | TMC controller adds blocks to an existing route. | <p>-For either planned or unplanned situations, the controller uses the CAD-AVL system to add a new block to a route by copying and modifying an existing block or by selecting route patterns active in the system. If copying an existing block, the controller inputs start and end times and can offset the schedule for the trips within the block by a number of minutes. The controller can also decide whether or not to include the reliefs from the original block in the new block. If creating a new block, the controller selects route patterns, the order of route patterns (i.e., select whether the block will start with an</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>Inbound or Outbound trip), and the start/end times and locations for the block.</p> <ul style="list-style-type: none"> -The controller specifies start/end times for the changes. The change can be for the current day or for multiple days and can be terminated earlier than the specified end time. Information is transmitted to prediction systems and trip planners. GTFS-RT TripUpdate will include the service change information for each day the service change is active. The change can be incorporated into static GTFS files exported from the CAD/AVL system. -Block changes are archived in a table in CAD-AVL database. -Information about the new block is transmitted to the MDT; operators are able to log into the new block. Operators can view schedule information and a paddle for the new block. All features function correctly on the IVU-3100 and IVU-4000. |
| FP2.8 | Service Change Tools | The CAD/AVL system shall provide features to remove blocks. | TMC controller removes blocks from an existing route. | <ul style="list-style-type: none"> -For either planned or unplanned situations, the controller selects block(s) to remove from the schedule. -The controller specifies start/end times during which the blocks will not be in service. The change can be for the current day or for multiple days and can be terminated earlier than the specified end time. Information is transmitted to prediction systems and trip planners. GTFS-RT TripUpdate will include the service change information for each day the service change is active. The change can be incorporated into |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | static GTFS files exported from the CAD/AVL system. -Block changes are archived in a table in CAD-AVL database. |
| FP2.9 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP2.10 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP2.11 | Service Change Tools | The CAD/AVL system shall provide features to input a schedule delta. | TMC controller shifts the entire schedule for a block. | -In OrbCAD, the schedule delta functionality will remain the same for both headway and schedule managed routes. That is, the vehicle is simply sent a new headway or schedule adherence threshold. In FMS, the schedule delta is a schedule modification with the following features: -In an unplanned situation, the controller uses the CAD-AVL system to shift the entire remaining schedule for a block or for all service on a route by a number of minutes. All schedule information associated with the block is updated. This tool functions for both headway-managed and schedule-managed routes. This information is transmitted to prediction systems and trip planners. GTFS-RT TripUpdate will include the service change information for each day the service change is active. This change is recorded in a database table in the CAD-AVL system. -The new schedule is transmitted to |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>the MDT and changes are reflected in the paddle on the MDT. All features function correctly on the IVU-3100 and IVU-4000.</p> <p>-Schedule deltas initiated in FMS will be displayed in OrbCAD if OrbCAD workstations are still in use.</p> |
| FP2.12 | Service Change Tools | The CAD/AVL system shall provide features to skip stops. | TMC controller selects which stops an individual vehicle or route shall skip | <p>-Stops to be skipped will be selected from a list of stops on one or more blocks on a route. All the trips using the selected stops between a provided start/end time will skip the stops. Information is transmitted to prediction systems and trip planners (i.e., GTFS-RT TripUpdate) and will have the affected stops marked as skipped. Service Alerts with a predefined message can be sent for skipped stops. The predefined message can be modified by the user.</p> <p>-The change is archived in the CAD-AVL system.</p> <p>-The operator is notified on the MDT via an automatically initiated Store & Forward data message once the skipped stop is saved. All features function correctly on the IVU-3100 and IVU-4000.</p> |
| FP2.13 | Service Change Tools | The CAD/AVL system shall provide features to initiate short turn operations. | TMC controller commands a short turn for an individual vehicle. | <p>-In an unplanned situation, the controller uses the CAD-AVL system to instruct an individual vehicle to short turn (turnback at a mid-route stop). The CAD-AVL system allows the TMC controller to select a turnback location from the list of upcoming stops on the trip. When the vehicle reaches that location, it ends its trip and begins the next trip early.</p> <p>-All information is communicated</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | to prediction systems and trip planners via GTFS-RT. The short turn is archived in the CAD-AVL system. The operator is notified on the MDT. -All features function correctly on the IVU-3100 and IVU-4000. Any changes are recorded to a database table. |
| FP2.14 | Service Change Tools | The CAD/AVL system shall provide features to hold or extend layover. | TMC commands a custom layover for a trip. | -In an unplanned situation, the controller sets a custom layover time for a trip. Terminal departure times are updated. The custom layover is communicated to prediction systems and trip planners via GTFS-RT. The custom layover is archived in the CAD-AVL system. -The operator is notified on the MDT. All features function correctly on the IVU-3100 and IVU-4000. Any changes are recorded to a database table. |
| FP2.15 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP2.16 | Service Change Tools | N/A - Removed from scope. This section intentionally left blank. | N/A | N/A - Removed from scope. This section intentionally left blank. |
| FP3.1 | Special Event Import | The CAD/AVL Schedule Management tool shall have a tabular user interface for creating new blocks. | The CAD/AVL Schedule Management tool shall have a tabular user interface for creating new blocks. | -The Schedule Management tool has a user interface (GUI) that allows the user to create new blocks in a table format. For each block, the GUI allows the user to manually enter schedule information for each trip in the block in a table (including the trip start time, route pattern, and direction) and to match the trips to runs and identify operator relief |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>points. The GUI also allows the user to import tabular data into the GUI from a file. The imported file will be a csv delimited file in a Conduent specified format.</p> <ul style="list-style-type: none"> -Blocks created in the Schedule Management tool are imported into the CAD-AVL system. When importing blocks into the CAD-AVL system, the user inputs which days the blocks will be in service. Blocks can also be saved and used in the future. -New blocks are transmitted to the MDT and new paddles are created. Operators are able to log into the block and view all schedule information. All features function correctly on the IVU-3100 and IVU-4000. -This information is transmitted to prediction systems and trip planners. Blocks imported using the Schedule Management Tool can be included in static GTFS files generated by the CAD/AVL system. |
| FP4.1 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Support same-day unscheduled block activation. | <ul style="list-style-type: none"> -The Schedule Management App shall support same-day activation of an Unscheduled Block: -Enable users preparing unscheduled blocks in the Schedule Management App to distinguish between routes and blocks with (1) known active dates and (2) unknown active dates -Represent routes and blocks with (1) known active dates and (2) unknown active dates differently in GTFS exports for ingestion by CIS (via Middleware) as follows: <ul style="list-style-type: none"> a. Routes and blocks with known start/end dates are included in GTFS static schedule files exported |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | <p>from the CAD/AVL system.</p> <p>b. Routes and blocks with unknown start/end dates may be excluded from GTFS static schedule files.</p> <p>c. Routes and blocks with unknown start/end dates may be included in GTFS schedule files. Trips for these blocks/routes should be associated with a service ID not used in the calendar or calendar_dates text files. If the block is “activated”, that information must then be transmitted to the customer information system via GTFS-RT. Note: it is only useful to include these trips in the GTFS schedule files if the trips can be “activated” in prediction systems via GTFS-RT. Note that this change will result in GTFS validation errors because service ID in the trips file is a foreign key referencing service ID in the calendar and calendar_dates file.</p> <p>-Enable operators to log into blocks for same-day unscheduled blocks</p> <p>-Communicate vehicle locations in the GTFS-RT feed for same-day unscheduled blocks</p> |
| FP4.2 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Setting unscheduled block date parameters. | <p>-The Schedule Management App shall allow user to input GTFS date parameters during creation of unscheduled blocks (e.g., to be able to specify start dates mid-signup) in order to select or deselect individual dates where the unscheduled blocks will be active.</p> <p>-For example, a user should be able to set the unscheduled blocks to take effect on specific days that don't necessarily align with day</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| | | | | types (e.g., take effect on 11/13/24, 11/15/24, 11/18/24, 11/19/24, etc.). |
| FP4.3 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Redefine unscheduled route ID when creating an unscheduled block. | -When an unscheduled route is created in Trapeze, it is assigned a route name prefixed with “sw”. When using the unscheduled route to create blocks, the user shall have the option to change the route ID and public-facing route name exported in the GTFS static schedule files. For example, if creating a block from Unscheduled Route 'swSCS', the user may redefine the route as 'S' for Public Display. If a block is created for a pre-existing route (example: we add a block for the “S”), it should appear to be the same route as scheduled blocks with the same name to the public. |
| FP4.4 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Build a Saturday, Sunday, or Weekday version of an unscheduled block from a single service type. | -Currently blocks for each schedule day type (Weekdays, Saturdays, Sundays) must be built separately. In order to operate the same block on a Weekday, Saturday, and Sunday, it has to be built three times. The Schedule Management App tool shall provide the ability to build a block once and use it for multiple day types. From a Weekday Unscheduled Block, it shall be possible to create a Saturday or Sunday version. In addition, it shall be possible to create a Weekday version from a Saturday or Sunday service type. All would be interchangeable from service type to service type. |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| FP4.5 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Editing running times. | <p>-The Schedule Management App tool shall allow for the management of trip running times:</p> <p>A) A method to edit trip running times when using an Unscheduled Route as a baseline.</p> <p>B) A method to select the running time when using a scheduled route and/or logic to match the trip start time to an existing trip start time.</p> <p>Examples:</p> <p>A) When building an Unscheduled Block from an Unscheduled Route there should be a method to edit the trip running time for each trip.</p> <p>B) When building a Unscheduled Block from a Scheduled Route, logic should exist where the trip start time on the Unscheduled Block matches the closest start time on the Scheduled Route and the running time is match from there. There should also be a method to edit the running time if necessary.</p> |
| FP4.6 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Activate apattern related functions. | <p>-The user shall have the option to activate apattern (i.e., DVAS code) related functions:</p> <p>A) Activate automatic headsighn control when creating an Unscheduled Block</p> <p>B) Activate automatic onboard annunciation when creating an unscheduled block</p> <p>-This would only be used for common terminals</p> <p>-The DVAS code will come from Trapeze or will be selected by the user from a list of destinations. Only destinations that are already defined in the schedule will be included in the pick list.</p> |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| FP4.7 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Hide trips from GTFS schedule files. | -Some blocks that are created for operations (like for the employee shuttle or testing) should not be included in any public-facing information. Right now, those blocks need to be manually deleted from the GTFS static schedule files after the files have been exported from OrbCAD. An option shall be provided to exclude selected blocks from the exported GTFS static schedule files, both for blocks created in the Schedule Management App tool as well as blocks created as part of the regular schedule. The blocks shall still be in use in service in the CAD/AVL system. |
| FP4.8 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Assign a specific starting terminal to an unscheduled block. | -Currently, an Unscheduled Block seems to 'pick' which terminal the first trip begins at. The user shall be able to select which terminal the Unscheduled Block would start at, i.e., allow users to select which direction/trip should be the first trip in the block. For example, When creating a 12 Line Unscheduled Block, the Schedule Management App software always selects the Jackson & Van Ness terminal to start the service. However, the service needs to start (defined by the time setting) at the Maine & Howard terminal instead. |
| FP4.9 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Update layover information in GUI. | -When assigning the layover time at terminals, it is difficult to understand where it is going to be applied. For clarity, more information shall be added to the GUI such as 'Outbound Layover Time is applied at the end of the Outbound Trip, before starting the inbound trip'. |

| Req. ID | Feature | High-Level Requirement | Use Case Name | Detailed Requirement/Use Case Description |
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| FP4.10 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Change paddle format and add custom notes. | <p>-The Schedule Management App tool can be used to export a paddle for new blocks but the paddle is missing critical information and custom notes cannot be added to the paddle.</p> <p>-The paddle format shall be updated to include all necessary schedule information. During the design phase, SFMTA shall provide a list of the missing critical information. The information will be added to the paddle if it is readily available in the schedule data.</p> <p>-A field shall be added to allow entry of custom notes that will be included on the paddle.</p> <p>-This change only affects the paddle displayed to the controller. The format of the paddle displayed to the operator on the MDT will not change.</p> |
| FP4.11 | Schedule Management App | The CAD/AVL system shall provide unscheduled routes enhancements. | Make manual changes to blocks created by the Schedule Management App | <p>-The user shall be able to manually add and delete trips on blocks created by the Schedule Management App.</p> |

Appendix C Technical Requirements

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|----------------------------------|--|--|
| TP1.1 | Enabling Infrastructure | Infrastructure shall be sized to support new features. | Sufficient DCC/GTMD resources shall be specified and implemented for higher location reporting rate via cellular. |
| TP1.2 | Enabling Infrastructure | Infrastructure shall be sized to support new features. | Sufficient disk space shall be specified and implemented for the increased polling rate. |
| TP1.3 | Enabling Infrastructure | Infrastructure shall be sized to support new features. | Conduent will provide information to allow SFMTA to configure the routers, firewalls and network |
| TP2.1 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The new virtualized environment shall deliver the same or better level of system performance as that of the original environment as demonstrated by test as defined in requirements TP 2-30 through TP 2-36. |
| TP2.2 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The VMWare architecture shall be comprised of a Primary and Secondary site with sufficient physical separation between the sites to ensure compliance with industry best practices for disaster isolation and recovery. Conduent assumes SFMTA provides all networking and routing between the sites including adequate network speed. |
| TP2.3 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The VMWare architecture shall be configured to operate in High Availability (HA) mode with Distributed Resource Scheduling (DRS) functionality. |
| TP2.4 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The VMWare architecture shall support and host a standalone test system for the CAD/AVL environment. |
| TP2.5 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | High-level design document describing the proposed system architecture, network and IT infrastructure configuration and VM specification recommendations, proposed Bill of Materials (BOM) for SFMTA procurement shall be provided. |
| TP2.6 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The production CAD/AVL environment shall be fully migrated into the new VMWare environment. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
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| TP2.7 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The VMWare architecture shall host 2 OrbCAD APP servers, 2 DCC servers, 2 ArcGIS servers, 2 Active DB servers, 2 LTDB servers, 1 Archive DB server (in cloud), 1 Management server, 6 Citrix servers, 2 Web servers, 2 Gateway servers, 1 Viriciti server, 1 SNMP server and 10 DIS servers for each site. |
| TP2.8 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The Primary and Secondary site shall consist of 4 ESXi hosts each, loaded with ESXi version 6.7 or the latest available compatible version confirmed by SFMTA IT department. |
| TP2.9 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The ESXi hosts shall be configured for High Availability (HA). |
| TP2.10 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | The ESXi hosts shall be configured with DRS (Distributed Resource Scheduling) Cluster. |
| TP2.11 | Virtualize OrbCAD Infrastructure | VMWare System Architecture shall be implemented | Replication to Secondary site shall support Failover to Secondary Site. |
| TP2.12 | Virtualize OrbCAD Infrastructure | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP2.13 | Virtualize OrbCAD Infrastructure | VMWare Environment shall be monitored | VMWare shall monitor and report HW/Host failures within the Primary site. |
| TP2.14 | Virtualize OrbCAD Infrastructure | VMWare Environment shall be monitored | VMWare shall monitor and report VM failures within the Primary site. |
| TP2.15 | Virtualize OrbCAD Infrastructure | VMWare Environment shall be monitored | VMWare shall monitor and report OS failures within the Primary site for OS running on virtual or physical machines. |
| TP2.16 | Virtualize OrbCAD Infrastructure | VMWare Environment shall be monitored | The system shall monitor and report Application failures within the Primary site. |
| TP2.17 | Virtualize OrbCAD Infrastructure | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP2.18 | Virtualize OrbCAD Infrastructure | HA Host shall be monitored | Monitors shall include the state of all protected VM's and slave hosts. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
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| TP2.19 | Virtualize OrbCAD Infrastructure | HA Host shall be monitored | Monitors shall include Host (HW) failure, network isolation and partition. |
| TP2.20 | Virtualize OrbCAD Infrastructure | HA Host shall be monitored | Monitors shall automatically restart individual VM's if their VMTools hearbeats stop. |
| TP2.21 | Virtualize OrbCAD Infrastructure | HA Host shall be monitored | Monitors shall check for heartbeats and I/O activity. |
| TP2.22 | Virtualize OrbCAD Infrastructure | HA Application shall be monitored | The OrbCAD application shall use VMWare SDK and integrate OrbCAD process to send customized heartbeats. |
| TP2.23 | Virtualize OrbCAD Infrastructure | HA Application shall be monitored | Monitors shall automatically restart VM if application hearbeats stop. |
| TP2.24 | Virtualize OrbCAD Infrastructure | Failover and Recovery functions shall be implemented | VMWare VM/OS Monitoring and Application monitoring shall be enabled by default. |
| TP2.25 | Virtualize OrbCAD Infrastructure | Recover Point for VMs (RP4VMs) shall be implemented | Replication shall operate at ESXi hypervisor level, independent of storage. |
| TP2.26 | Virtualize OrbCAD Infrastructure | Recover Point for VMs (RP4VMs) shall be implemented | Continuous DVR like remote replica and point in time recovery shall be implemented. |
| TP2.27 | Virtualize OrbCAD Infrastructure | Recover Point for VMs (RP4VMs) shall be implemented | RP4VM's splitter shall intercept data that VM's write to their VMDK's (Virtual Machine Disk File) and send to vRPA (virtual Recover Point Appliance) at primary site. |
| TP2.28 | Virtualize OrbCAD Infrastructure | Recover Point for VMs (RP4VMs) shall be implemented | vRPA shall send data over WAN to peer vRPA at DR site. |
| TP2.29 | Virtualize OrbCAD Infrastructure | Recover Point for VMs (RP4VMs) shall be implemented | vRPA at DR site shall send data to ESXi that hosts shadow copy VM where splitter writes it to replica dtrastore (VMDK's). |
| TP2.30 | Virtualize OrbCAD Infrastructure | Performance Baseline #1 - AVL data latency performance of virtualized environment shall be qualified | The performance for AVL data latency (i.e. CIS real time data latency) shall be measured before and after the virtualization upgrade and the new environment shall perform equal to or better than the original baseline. |
| TP2.31 | Virtualize OrbCAD Infrastructure | Performance Baseline #1 - AVL data latency performance of | The AVL data latency (i.e. CIS real time data latency) in the original environment shall be used as a baseline metric to evaluate performance. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
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| | | virtualized environment shall be qualified | |
| TP2.32 | Virtualize OrbCAD Infrastructure | Performance Baseline #1 - AVL data latency performance of virtualized environment shall be qualified | Data latency shall be measured from the time the OrbCAD DCC receives the batched AVL messages to the time that those messages exit the STP Server. |
| TP2.33 | Virtualize OrbCAD Infrastructure | Performance Baseline #1 - AVL data latency performance of virtualized environment shall be qualified | A performance tracking app shall be provided which continuously parses the STP logs and provides metrics as hourly average latency. |
| TP2.34 | Virtualize OrbCAD Infrastructure | Performance Baseline #2 - Schedule Import Time performance of virtualized environment shall be qualified | The performance baseline for Schedule Import Time shall be measured before and after the virtualization upgrade and the new environment shall perform equal to or better than the baseline. |
| TP2.35 | Virtualize OrbCAD Infrastructure | Performance Baseline #2 - Schedule Import Time performance of virtualized environment shall be qualified | Schedule import time shall be measured with a reference dataset on the original system to establish a baseline for this parameter. |
| TP2.36 | Virtualize OrbCAD Infrastructure | Performance Baseline #2 - Schedule Import Time performance of virtualized environment shall be qualified | The schedule import time shall be measured on the new virtualized environment using the same reference dataset as is used to establish the baseline for the original environment. |
| TP2.37 | Virtualize OrbCAD Infrastructure | ArcGIS software upgrade shall be configured | ArcGIS license and configuration information shall be provided to SFMTA for their procurement of the ArcGIS licenses for the new environment. |
| TP2.38 | Virtualize OrbCAD Infrastructure | Block number size shall be increased. | System shall support up to 10000 vehicle block numbers per booking. |
| TP2.39 | Virtualize OrbCAD Infrastructure | SQL Database Configuration | The new archive database shall be created as an Azure SQL Managed Instance. |
| TP2.40 | Virtualize OrbCAD Infrastructure | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP2.41 | Virtualize OrbCAD Infrastructure | SQL Database Configuration | Primary Keys shall be unique and shall not be recycled in 50 years. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
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| TP2.42 | Virtualize OrbCAD Infrastructure | SQL Database Configuration | All tables shall have one Primary Key. |
| TP3.1 | Test Environment | Conduent shall provide a test environment. | Simulated data for the test environment shall be obtained by playing GPS data into an existing SFMTA Bus-in-the-Box (BIB). A GPS Playback simulator with cable shall be provided. The simulator will run on an SFMTA provided laptop or computer. An initial set of GPS playback data files shall be provided. |
| TP3.2 | Test Environment | Conduent shall provide a test environment. | Test environment shall generate the AVL reports (i.e., CIS real time data), GTFS static, and GTFS real time data feeds for the BIB(s) in the same format as the production system. |
| TP3.3 | Test Environment | Training Functions | The test environment shall support functions for training controllers, with simulated revenue vehicle (i.e., BIB) data and TMC console functionality identical to revenue system including messaging between controller and vehicle. |
| TP3.4 | Test Environment | Training Functions | The test environment shall support testing with a SFMTA provided BIB. |
| TP4.1 | Network Architecture Changes | Conduent shall modify the CAD/AVL system application on network infrastructure. | There shall be two (2) clustered & load balanced DCC's where the load balancing is done by configuring vehicles to communicate with one DCC or the other. |
| TP4.2 | Network Architecture Changes | Conduent shall modify the CAD/AVL system application on network infrastructure. | There shall be one (1) DIS per yard plus one (1) spare, at the primary data centers. |
| TP4.3 | Network Architecture Changes | Conduent shall modify the CAD/AVL system application on network infrastructure. | SQL express shall be implemented on the DIS. |
| TP4.4 | Network Architecture Changes | Conduent shall modify the CAD/AVL system application on network infrastructure. | Archive database shall be fully supported as implemented in the cloud, by SFMTA as SQL as a service (i.e. Azure SQL Managed Instance as referenced in TP-2.39). |
| TP5.1 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | No functionality of OrbCAD 13.72 shall be deprecated without the approval of SFMTA. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|---------------------------|--|---|
| TP5.2 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | Performance of OrbCAD Y.Y shall be greater to existing version of OrbCAD 13.72. |
| TP5.3 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when typing. |
| TP5.4 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when scrolling. |
| TP5.5 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when accessing a menu. |
| TP5.6 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when executing a command. |
| TP5.7 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when selecting an object. |
| TP5.8 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when invoking and interacting with a dialog box. |
| TP5.9 | Deployment of OrbCAD Y. Y | Conduent shall deploy latest version of OrbCAD on new infrastructure. | There shall be no noticeable delay when opening an incident report. |
| TP5.10 | Deployment of OrbCAD Y. Y | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP6.1 | Cellular Data | Conduent shall send data communications from the IVU to the DCC via cellular with no backup to the L3Harris network. | No data of ICD X.X shall be deprecated without approval of SFMTA. |
| TP6.2 | Cellular Data | Conduent shall send data communications from the IVU to the DCC via | Five (5) second polling rate shall be available by default. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|----------------------|--|---|
| | | cellular with no backup to the L3Harris network. | |
| TP6.3 | Cellular Data | Conduent shall send data communications from the IVU to the DCC via cellular with no backup to the L3Harris network. | Variable smart polling functionality shall be supported on the IVU-4000. |
| TP6.4 | Cellular Data | Conduent shall send data communications from the IVU to the DCC via cellular with no backup to the L3Harris network. | There shall be support for all IVU-OrbCAD data comm, both inbound/outbound, via cellular data with voice comm remaining on the radio. |
| TP6.5 | Cellular Data | Conduent shall send data communications from the IVU to the DCC via cellular with no backup to the L3Harris network. | There shall be a user configurable "fast poll" function that causes a vehicle to send updates at intervals no greater than 5 seconds. |
| TP6.6 | Cellular Data | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP7.1 | Mobile Data Terminal | Mobile data terminal shall update the paddle over the cellular data connection. | Paddle shall be updated for changes in operator work made for planned and unplanned service changes. |
| TP7.2 | Mobile Data Terminal | Mobile data terminal shall update the paddle over the cellular data connection. | Paddle shall update for the IVU3100 and IVU4000 when service changes occur. |
| TP7.3 | Mobile Data Terminal | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP7.4 | Mobile Data Terminal | Color coding of vehicle RSA status. | The on-time performance status when the vehicle is in schedule mode shall be color-coded with different colors when vehicle is on-time, late, or early. |
| TP7.5 | Mobile Data Terminal | RSA Alarms | The MDT issues an audible alarm when the operator is running early or late. Each audible alarm can be enabled or disabled independent from the other audible alarm. The threshold for what constitutes "early" can be different from the threshold for what constitutes "late". |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|--------------------|---|--|
| TP8.1 | Cellular Bulk Data | The vehicle shall perform the bulk data transfer over the cellular data connection. | There shall be no functional requirement for reboot of the IVU while it is in revenue service. |
| TP8.2 | Cellular Bulk Data | The vehicle shall perform the bulk data transfer over the cellular data connection. | Bulk Data Transfer shall be monitored and reported/alarmed. |
| TP8.3 | Cellular Bulk Data | The vehicle shall perform the bulk data transfer over the cellular data connection. | Geo-triggered bulk data transfer shall be implemented for the IVU4000. |
| TP8.4 | Cellular Bulk Data | The vehicle shall perform the bulk data transfer over the cellular data connection. | Geo-triggered bulk data transfer shall be implemented for the IVU3100. |
| TP8.5 | Cellular Bulk Data | The vehicle shall perform the bulk data transfer over the cellular data connection. | No data of ICD X.X shall be deprecated without approval of SFMTA. |
| TP9.1 | Web-based UI | Conduent shall implement a web-based incident form. | Provide prototypes of incident forms. |
| TP9.2 | Web-based UI | Conduent shall implement a web-based incident form. | Incident forms shall be editable and configurable including ability to manage TAB indexing, logic including to skip to next section if a "no" in input, ability to edit field responses, and ability to prepopulate field responses. |
| TP9.3 | Web-based UI | Conduent shall implement a web-based UI/front end. | Headway GUI shall show all vehicles at the terminal, their order of departure, and their approximate departure times. |
| TP9.4 | Web-based UI | Conduent shall implement a web-based incident form. | Modify reason options under the performance tools (ex. we do not need snowstorm but would likely need disabled vehicle). |
| TP9.5 | Web-based UI | Conduent shall implement a web-based UI/front end. | The web-based UI shall support customizable primary, secondary, and accent colors. |
| TP9.6 | Web-based UI | Conduent shall implement a web-based UI/front end. | Fonts and typography styles used in the web-based UI shall support customizable font families, weights, sizes, and line heights. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|--------------|---|---|
| TP9.7 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.8 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.9 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.10 | Web-based UI | Conduent shall implement a web-based UI/front end. | Web-based interface shall work on standard issue version of Microsoft Edge browser. |
| TP9.11 | Web-based UI | Conduent shall implement a web-based UI/front end. | No functionality of OrbCAD 13.72 shall be deprecated without the approval of SFMTA. |
| TP9.12 | Web-based UI | Conduent shall implement a web-based UI/front end. | UI changes from Windows application to web-based front end shall be approved by SFMTA limited to new features only. |
| TP9.13 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when typing. |
| TP9.14 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when scrolling. |
| TP9.15 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when accessing a menu. |
| TP9.16 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when executing a command. |
| TP9.17 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay selecting an object. |
| TP9.18 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when invoking and interacting with a dialog box. |
| TP9.19 | Web-based UI | Conduent shall implement a web-based UI/front end. | There shall be no noticeable delay when opening an incident report. |
| TP9.20 | Web-based UI | Conduent shall implement a web-based UI/front end. | Headway monitoring tool route direction shall reflect US right-side driving. |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|--------------|---|---|
| TP9.21 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.22 | Web-based UI | Conduent shall implement a web-based UI/front end. | AVL map layers shall be automatically generated for each Muni line based on the line geometry embedded in the data from Trapeze schedule import. The layers shall be available for every user. The Muni line displayed will be a superset of all patterns for the line. |
| TP9.23 | Web-based UI | Conduent shall implement a web-based UI/front end. | SFMTA-specific infrastructure icons and layers on the map shall be consistent with the previous version of OrbCAD. |
| TP9.24 | Web-based UI | Conduent shall implement a web-based UI/front end. | The web-based UI shall provide a fully integrated user selectable satellite view map layer. SFMTA is responsible for the ESRI online subscription. |
| TP9.25 | Web-based UI | Conduent shall implement a web-based UI/front end. | The web-based UI shall provide a fully integrated user selectable live-traffic view map layer. SFMTA is responsible for the ESRI online subscription. |
| TP9.26 | Web-based UI | Conduent shall implement a web-based UI/front end. | Format of the paddle in the GUI shall be the same as the Schedule Viewer. During the design phase, SFMTA shall provide examples of the Schedule Viewer format. Any information that is not currently displayed in the paddle will be added to the paddle if it is readily available in the schedule data. |
| TP9.27 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.28 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.29 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.30 | Web-based UI | Message response options | The message "call" button for sending text messages shall be labeled "send." |
| TP9.31 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|------------------|--|---|
| TP9.32 | Web-based UI | AVL map | When a user clicks on a vehicle, a pop up on the AVL map shall display vehicle ID, operator, ID, block ID, run ID, route, direction, on-time performance information (late/early/on-time) or headway status (gapped/bunched/on-headway), real-time passenger loads. The data displayed shall be configurable. |
| TP9.33 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.34 | Web-based UI | Schematic Route Diagram | The schematic route diagram, i.e., Headway Monitoring, shall show timepoint locations. |
| TP9.35 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.36 | Web-based UI | Schematic Route Diagram | Users shall be able to open route diagrams for multiple routes simultaneously. |
| TP9.37 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.38 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.39 | Web-based UI | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP9.40 | Web-based UI | Message list | The Message response and communication history UIs provide a list of outbound messages to vehicles and the vehicles responses which are not filtered by routes and does not display inbound messages from the vehicles. Inbound messages can be viewed in the Incident Search UI. |
| TP10.1 | GTFS File Format | OrbCAD shall export two GTFSs, one accommodating multiple service IDs. | OrbCAD shall generate two GTFS files One with multiple service_IDs per service day, one with a single service_IDs per day. |
| TP10.2 | GTFS File Format | OrbCAD shall export two GTFSs, one accommodating multiple service IDs. | Shall have the ability to create each one separately; so that when we are able to transition, we simply do not "push the button" to produce the GTFS with only single service_IDs per day |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description | | | | | | | | | | | | | | | | |
|-----------------------|--------------------|---|---|-----------------------|--|---------------|--|------------|---|---|--|-------------------|---|---|--|--------|---|---|--|
| TP10.3 | GTFS File Format | trips.txt format modifications | Two additional columns shall be added to trips.txt: 1) wheelchair accessible 2) bikes allowed SFMTA shall add the data to the routes GTFS Supplemental Data API. | | | | | | | | | | | | | | | | |
| TP10.4 | GTFS File Format | trips.txt format modifications | The new columns in trips.txt shall be based on vehicle type: <table style="margin-left: 40px; border-collapse: collapse;"> <tr> <td style="padding-right: 20px;">wheelchair accessible</td> <td></td> </tr> <tr> <td>bikes allowed</td> <td></td> </tr> <tr> <td>Cable Cars</td> <td style="text-align: right;">0</td> </tr> <tr> <td>0</td> <td></td> </tr> <tr> <td>Bus (rubber tire)</td> <td style="text-align: right;">1</td> </tr> <tr> <td>1</td> <td></td> </tr> <tr> <td>Rails*</td> <td style="text-align: right;">1</td> </tr> <tr> <td>0</td> <td></td> </tr> </table> *including Historic SFMTA shall add the data to the routes GTFS Supplemental Data API. | wheelchair accessible | | bikes allowed | | Cable Cars | 0 | 0 | | Bus (rubber tire) | 1 | 1 | | Rails* | 1 | 0 | |
| wheelchair accessible | | | | | | | | | | | | | | | | | | | |
| bikes allowed | | | | | | | | | | | | | | | | | | | |
| Cable Cars | 0 | | | | | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | | | | | | |
| Bus (rubber tire) | 1 | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | |
| Rails* | 1 | | | | | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | | | | | | |
| TP10.5 | GTFS File Format | calendar.txt modifications | User shall be permitted to specify a different start date than the booking date with no change to the end date. | | | | | | | | | | | | | | | | |
| TP11.1 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.2 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.3 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.4 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.5 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.6 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank | | | | | | | | | | | | | | | | |
| TP11.7 | Schedule Interface | OrbCAD import Performance | OrbCAD shall provide robust import performance such that a full quarterly schedule shall be better than current import process performance. | | | | | | | | | | | | | | | | |

| Req. ID | Feature | High-Level Requirement | Detailed Requirement/Use Case Description |
|---------|--|---|---|
| TP11.8 | Schedule Interface | OrbCAD export Performance | OrbCAD shall provide robust export performance such that a full quarterly schedule shall be better than current performance to export and process via GTFS. |
| TP11.9 | Schedule Interface | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP12.1 | Vehicle Event Integration to CIS | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP13.1 | Real-Time Service Changes (RTSC) Tools | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP13.2 | Real-Time Service Changes (RTSC) Tools | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP13.3 | Real-Time Service Changes (RTSC) Tools | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |
| TP14.1 | Replay | N/A - Removed from scope, This section intentionally left blank | N/A - Removed from scope, This section intentionally left blank |

Appendix D
Milestone Payment Schedule

Agreement cost shall not exceed **\$3,497,000.00**. This includes all labor costs and travel and markup.

Payment Milestones will be as follows:

| # | Milestone Description | Percentage | USD |
|----------|---|-------------------|-----------------------|
| 1 | Project Schedule Complete & Phase 1 Requirements Accepted | 5% | \$174,850.00 |
| 2 | Phase 2 Design Review Accepted | 10% | \$349,700.00 |
| 3 | Phase 1 Deployment Accepted | 15% | \$524,550.00 |
| 4 | Phase 3 Design Review Accepted | 15% | \$524,550.00 |
| 5 | Phase 2 Deployment Accepted | 15% | \$524,550.00 |
| 6 | Phase 4 Design Review Accepted | 10% | \$349,700.00 |
| 7 | Phase 3 Deployment Accepted | 15% | \$524,550.00 |
| 8 | Phase 4 Deployment Accepted | 10% | \$349,700.00 |
| 9 | Punch-list Accepted | 5% | \$174,850.00 |
| | TOTAL | 100% | \$3,497,000.00 |

Appendix E Project Schedule

The following is an **estimated 36 month schedule** of the 4 phases, assuming contract signature in Q4 2024 and January 2025. The formal schedule will be finalized after NTP.

This schedule may be revised in accordance with Section 11.15 of this Agreement.

| SFMTA Bundle 4 Phase Draft Schedule | | 2024 | | 2025 | | | | | | | | | | | | 2026 | | | | | | | | | | | |
|---|---|-------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | | | | | | | | | | | | | |
| | | Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| | Contract/NTP | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase 1 Headway Pullout Alarm/Terminal Departure in existing 13.72 build | Phase 1 Engineering | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 System Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 FAT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 FAT Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 Field Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 Field Testing Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 1 Cutover/Deployment | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase 2 - Merge Headway into new build OrbCAD Upgrade, Virtualization, ArcGIS Update, & Test System GTFS Static File Changes (Multiple service IDs, export w/different start date) GTFS Static File Changes (new fields in trips.txt) GTFS Real Time Trip Modifications Remove blocks from GTFS Static export. | Phase 2 Design Review | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 Conduent lab setup | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 Conduent Software build/testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 FAT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 FAT Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 Field Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 Field Testing Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 2 Cutover/Deployment | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase 3 - Bulk Data Transfer Over Cellular & Cellular Data w/L3Harris Voice, IVU-4000 Smart Polling Unscheduled Route/Block Enhancements Items 1 and 2 (i.e., Schedule Mgmt App Updates) & "Unsched Route/Block Enhancements Items 3 to 11 (i.e., Sched Mgmt App Updates)" Color coding of vehicle RSA status and headway status. Bulk Data Transfer (BDT) monitoring Include reliefs on blocks created by Sched Mgmt App. | Phase 3 Design Review | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 Engineering | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 System Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 FAT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 FAT Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 Field Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 Field Testing Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 3 Cutover/Deployment | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phase 4 - FMS Upgrade, OTA Paddle, Incident form, FMS color font customization. Headway monitoring tool route direction reflect US right-side driving. FMS paddle in Schedule Viewer format. Stop relocation Add Trips: Block start/end times are updated automatically. Change can apply to current day or multiple days. Schedule delta on a route (i.e., Shift Trips) with OTA paddle. Early turnback at a stop (instead of timepoint) Custom layover time for a trip on headway based route | Phase 4 Design Review | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 Engineering | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 System Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 FAT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 FAT Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 Field Testing | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 Field Testing Bugfix | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Phase 4 Cutover/Deployment | | | | | | | | | | | | | | | | | | | | | | | | | | |