July19, 2022

LOS ANGELES FIRE DEPARTMENT

KRISTIN M. CROWLEY
FIRE CHIEF

June 30, 2022

BOARD OF FIRE COMMISSIONERS
FILE NO. 22-064

TO: Board of Fire Commissioners

FROM: Kristin M. Crowley, Fire Chief

SUBJECT: AGREEMENT WITH MOTOROLA SOLUTIONS, INC. FOR THE VOICE RADIO SYSTEM UPGRADE

FINAL ACTION:	——— Approved	——— Approved w/Corrections	——— Withdrawn
	——— Denied	——— Received & Filed	——— Other

SUMMARY

The Los Angeles City Fire Department (LAFD) requires a reliable, mission critical voice radio system to dispatch resources and support firefighter safety during calls for service. Many of the components of the existing 800 MHz analog conventional simulcast system were purchased over 30 years ago and are beyond their end of life and end of support dates. Over the last few years, there have been multiple documented failures resulting from the aging system components, including dispatch consoles, voter alignment issues, repeater antennas, etc. Due to the aging nature of the radio system, the LAFD will need to replace the system's components by contracting with Motorola Solutions, Inc. ("Motorola"). Motorola has provided the LAFD with high-performance equipment and quality customer service for many decades, and has a well-established understanding of the City's existing infrastructure and service needs. This proposed Agreement provides a combination of hardware, software and services, which include:

- Upgrading the system's aging voters and transceivers at the Fire Communications Center and at each of the nine (9) LAFD remote sites, as well as expanding the system to feature twenty (20) total channels across all nine (9) sites.
- Upgrading to Motorola's G-series radio platform. This platform features the same technology currently in use by the Los Angeles Police Department, which will increase interoperability options between the City's two public safety agencies, as well as neighboring agencies.
- Replacing existing dispatch consoles with one hundred (100) Command Central AXS Dispatch consoles for both the primary and backup dispatch centers.

This Agreement to upgrade the LAFD's voice radio system is critical for maintaining command and control of the Department's resources and firefighter safety. These improvements will also improve the City's and the LAFD's position for responding to future emergency and planned events, including the LA 2028 Summer Olympics.

The City has found that an Agreement for the voice radio system upgrade does not require a City Charter Section 1022 determination because Motorola requires the use of its staff to install, maintain or service equipment or other products in order to maintain warranties.

The proposed term for this Agreement is for three (3) years, commencing upon the date of execution by the City Clerk, and terminating three (3) years from that date, for an amount not to exceed $17,953,555.68. Thereafter, the LAFD will have the option to purchase extended maintenance services, exercised in five (5) one-year increments, for a cumulative amount not to exceed $11,246,822, contingent upon the availability of funds and the contractor having provided satisfactory services under the Agreement.

The attached Agreement has been reviewed and approved by the City Attorney as to legal form. Pursuant to Los Angeles City Charter Section 373, approval by the City Council is required.

RECOMMENDATIONS

That the Board:

1. Approve and authorize the Fire Chief to execute an Agreement with Motorola Solutions, Inc. to provide for hardware, software and professorial installation services for the voice radio system upgrade for a three (3) year term, commencing upon the date of execution by the City Clerk, and terminating three (3) years from that date, and for an amount not to exceed $17,953,555.68, with the authority for the Fire Chief to execute amendments to extend the term of the Agreement for up to five (5) additional years, exercisable in one-year increments, for a cumulative amount not to exceed $11,246,822, contingent on the availability of funds and the contractor having provided satisfactory services in the Agreement and subject to review and approval by the City Attorney.

2. Transmit the Agreement to the Mayor for review and approval, in accordance with Executive Directive No. 3.

FISCAL IMPACT

There is no impact to the General Fund. Funding for this Agreement is available from the Municipal Improvement Corporation of Los Angeles (MICLA) Financing, consisting of $6.4 million that was awarded to the Information Technology Agency and has been reauthorized to the LAFD, $4 million that will be provided from the FY 2022-23 Approved Budget, and $7.6 million that will be requested in the FY 2023-24 Budget, for a total of $18,000,000. Subsequent contract extensions are contingent on the availability of funds.

Board Report prepared by Alfonso Ruiz, Battalion Chief, and Kanwarjit Bhopal, Sr. Management Analyst I, Information Technology Bureau, Fire Communications Dispatch Support Section.

Attachment

AGREEMENT NO. _____

AGREEMENT BETWEEN

THE CITY OF LOS ANGELES

AND

MOTOROLA SOLUTIONS, INC.

FOR

LAFD VOICE RADIO SYSTEM UPGRADE

Table of Contents

AGREEMENT NO. _____

AGREEMENT
BETWEEN THE CITY OF LOS ANGELES
AND
MOTOROLA SOLUTIONS, INC.

This Agreement (hereinafter referred to as "Agreement") is made and entered into by and between the City of Los Angeles, a municipal corporation (hereinafter referred to as "City"), acting by and through the Los Angeles Fire Department (hereinafter referred to as "LAFD" or "the Department"), and Motorola Solutions, Incorporated, a Delaware Corporation (hereinafter referred to as "Contractor" or "Motorola"), with reference to the following:

RECITALS

WHEREAS, the day-to-day operations of the Los Angeles Fire Department and the safety of its members, relies on an integrated and complex system of telecommunications networks, mobile and handheld radios, computer hardware and software, collectively known as the Voice Radio System (VRS) or Land Mobile Radio System (LMRS), to provide mission-critical voice communications to and from field personnel; and

WHEREAS, the current LAFD VRS is more than 30 years old and has many hardware and software components that are no longer commercially supported or available to purchase making it difficult for the City's Information Technology Agency (ITA) and the LAFD to properly and pro-actively maintain the system, increasing the potential frequency of system disruption and outages related to equipment failures of this mission-critical, frontline emergency communications system; and

WHEREAS, due to the high degree of risk, cost and complexity, upgrading the entire LAFD VRS system with a complete brand-new system, using different technology and frequencies would be operationally disruptive and fiscally imprudent; and

WHEREAS, ITA and the LAFD have determined that refreshing, updating, upgrading and replacing the aging components with the most current and fully supported equipment equivalents and focusing first on replacing those components that are most susceptible to failure, would be the most prudent and fiscally responsible path forward; and

WHEREAS, LAFD has conducted a cost analysis of available alternatives and determined that upgrading the existing system is the most cost-effective alternative to meet the LAFD's needs; and

WHEREAS, ITA began work in July 2020 on several capital improvement projects needed to update the various physical sites located throughout the City that house the radio system in order to prepare them for this project and to make them ready for new LAFD VRS components; and

WHEREAS, the replacement of the current voice radio system components must be done in a manner that allows the new system components to co-exist and operate in parallel with the

current system components for a period of time without disruption to the day-to-day LAFD operations, and provide a modern, commercially supported platform that allows for the future expansion, interoperability with the Los Angeles Police Department and the LAFD area partners and for future innovation of the LAFD VRS over time; and

WHEREAS, the Contractor is a professional corporation with more than 90 years of experience designing, developing, delivering and supporting telecommunications systems for other major cities and municipalities located throughout the United States, including New York City, Houston, Boston, and Washington D.C.; and

WHEREAS, the Contractor has proposed a unique and proprietary solution that allows for the seamless upgrading of LAFD's existing VRS using commercial-off-the-shelf equipment that is fully supported by the Contractor and readily available for use, without degradation or loss of existing functionality and capabilities, and allows for the supply of an adequate cache of spare parts; and

WHEREAS, pursuant to Charter Section 371(e), competitive bidding is not required as the services contemplated involve the performance of professional, scientific, expert, or technical services, and the use of competitive bidding is otherwise undesirable, impractical, or impossible; and

WHEREAS, pursuant to Charter Section 372, obtaining competitive proposals is not reasonably practicable or compatible with the City's best interests; and

WHEREAS, the City and Contractor desire to enter into this Agreement for a three (3) year term not to exceed $17,953,555.68, subject to the availability of funds.

WHEREAS, Contractor agrees that City may purchase, at City's sole discretion, five (5) years of additional maintenance support, exercisable in five (5) one-year increments and at a cumulative cost not to exceed $11,246,822, subject to the limitations of this Agreement.

NOW, THEREFORE, the City and the Contractor agree as follows:

1.0 Section 1: General Information

1.1 Project Overview

The purpose of this project is to upgrade current aging LAFD voice radio system infrastructure components at each of nine (9) radio tower sites and various other locations throughout the City, including City Hall East and the Metro Fire Communications Center, with a modern, commercially available, and fully supported land mobile radio and dispatch console solution, without disruption of current operational service.

1.2 Parties to the Agreement

A. City – The City of Los Angeles, a municipal corporation, having its principal office at 200 North Spring Street, Los Angeles, CA, 90012

B. Contractor – Motorola Solutions, Inc., a Delaware State Corporation, having its principal office at 500 W. Monroe Street, Chicago, Illinois 60661.

1.3 Contractor's Representative

Contractor hereby appoints the following person to represent Contractor with respect to all matters pertaining to this Contract. Said representative shall be responsible for submitting all of the respective notices, reports, invoices, and other documents or information as required by this Contract.

Name:	Joe Warner
Title:	Senior Account Executive, City of Los Angeles
Address:	725 S. Figueroa St. Suite 1855 Los Angeles CA 90012
Telephone:	(312) 204-9300
E-Mail:	joseph.warner@motorolasolutions.com

1.4 City's Representative

City hereby appoints the following person to represent the City with respect to all matters pertaining to this Contract. Said representative shall be responsible for submitting all of the respective notices, reports, and other documents or information as required by this Contract.

Name:	Kristin M. Crowley
Title:	Fire Chief
Address:	200 N. Main Street, Room 1800 Los Angeles, CA 90012
Telephone:	(213) 978-3800
Email:	lafdfirechief@lacity.org

With copies to:

Name:	S. Jenny Park

Title: Fire Administrator
Address: 200 N. Main Street, Room 1630
Los Angeles, CA 90012
Telephone: (213) 978-3731
Email: s.jenny.park@lacity.org

And

Name: Emilio Rodriguez, Jr.
Title: Chief Management Analyst
Address: 200 N. Main Street, Room 1630
Los Angeles, CA 90012
Telephone: (213) 978-3478
Email: emilio.rodriguez@lacity.org

And

Name: Carr Oduro
Title: Senior Systems Analyst
Address: 200 N. Main Street, Room 1680
Los Angeles, CA 90012
Telephone: (213) 922-7761
Email: carr.oduro@lacity.org

1.5 Contractor's Project Manager
Contractor hereby appoints the following person to act as the Project Manager on behalf of the Contractor.

Name: Rebecca Burbink
Title: Sr. Project Manager
Address: 725 S. Figueroa St.
Suite 1855
Los Angeles CA 90012
Telephone: (619) 572-2133
E-Mail: rebecca.burbink@motorolasolutions.com

1.6 City's Project Manager
City hereby appoints the following person to act as the Project Manager on behalf of the City.

Name: Alfonso Ruiz
Title: Battalion Chief
Address: 500 E. Temple Street
Los Angeles, CA 90012
Telephone: (213) 910-7107
Email: al.ruiz@lacity.org

And

Name: Cristina Tolentino
Title: Information Systems Manager I
Address: 200 N. Main Street, Room 1400
Los Angeles CA 90012
Telephone: (213) 978-0863
E-Mail: cristina.tolentino@lacity.org

1.7 Notices, Demands and Communications

Formal notices, demands, and communication required hereunder by either party shall be made in writing and may be affected by personal delivery or by registered or certified mail, postage prepaid, return receipt requested and shall be deemed communicated as of the date of mailing. Formal notices, demands, and communications from the Contractor shall be given to the City's Representative with copies to the City's Project Manager.

If the name of the person designated to receive the notices, demands, or communications or the address of such person is changed, written notice shall be given, in accordance with this Section, within fifteen (15) working days of said change.

2.0 Section 2: Term of Agreement

2.1 Term

2.1.1 This Agreement is effective upon the date of attestation by the Los Angeles City Clerk (the "Effective Date").

2.1.2 Unless the Agreement is terminated earlier pursuant to Section 2.5 below, the term of the Agreement will commence on the Effective Date and will terminate three (3) years from that date.

2.1.3 Contractor shall provide to City one year of warranty services commencing upon the day following Final System Acceptance (as defined in Section 5 of **Appendix B, Scoping Statement of Work**). At City's option, City may purchase and Contractor agrees to provide, five years of maintenance support services at the pricing set forth in Section 9 of Appendix B, commencing immediately upon completion of the one year of warranty services. City's right to purchase maintenance support services may be exercised in five (5) one year options with any such purchase memorialized by amendment to this Agreement pursuant to Section 2.2, below.

2.1.4 Contractor shall provide City with at least two (2) years' prior written notice of the end of life or end of support of all hardware, software, firmware, or other System components.

2.2 Amendments

This Agreement may be extended for an additional five (5) years, exercised in five (5) one-year increments, utilizing the amendment process described in Section PSC-5

Amendment, of **Appendix A – Standard Provisions for City Contracts (Rev. 10/21)[v.4]**, attached hereto and incorporated by reference herein.

2.3 Ratification of Agreement

To the extent that the Contractor may have begun performance of the services before the date of execution at the City's request and due to the immediate needs of the LAFD, the City hereby ratifies and accepts those services performed in accordance with this Agreement and authorizes payment as provided by the terms of this Agreement. Notwithstanding this Section, the term of this Agreement will remain as stated above.

2.4 Suspension

At City's sole discretion, City may suspend any or all services provided under this Agreement by providing Contractor with written notice of suspension. Upon receipt of the notice of suspension, Contractor shall immediately cease the services suspended and shall not incur any additional obligations, costs or expenses to City until City gives written notice to recommence the services. In the event of a suspension under this provision, and provided that said suspension is not a result of Contractor's failure to perform, , the Parties will negotiate in good faith a change order which addresses any reasonable charges that may be incurred because of the delay specifically applicable to the work being performed during the applicable delivery milestone. Delay charges may include costs incurred by Contractor or its subcontractors for additional freight, warehousing and handling of equipment; extension of the warranties; travel; suspending and re-mobilizing the work; additional engineering, project management, and standby time calculated at then current rates; and preparing and implementing an alternative implementation plan.

2.5 Termination

This Agreement may be terminated in accordance PSC-9 of the Standard Provisions of City Contracts (Rev. 10/21)[v.4], which provision is incorporated herein as though fully set forth below, with the exception of Subsection PSC-9(B)(6), the language of which is instead replaced with the following:

In the event City terminates this Agreement as provided in this section due to Contractor's default or breach of this Agreement, City may procure, upon such terms and in the manner as City may deem appropriate, services substantially similar in scope and level of effort to those so terminated, and Contractor shall be liable to City for all of its reasonable costs and damages, including, but not limited to, any reasonable excess costs for such services.

3.0 Section 3: Scope of Work

3.1 Upgraded Voice Radio System

As further described in **Appendix B, Scoping Statement of Work**, Contractor shall provide City all the services and deliverables necessary to upgrade City's radio system infrastructure. Contractor shall provide an upgraded system (the "System") that: (i) meets or exceeds all of the

City's functional and technical requirements as described in **Appendix C, High-Level Specifications**; (ii) contains no less than the functionality currently available to City in City's radio system that exists as of the Effective Date, or exceeds or modifies that functionality in a form and manner agreed to by City and in this Agreement; and (iii) meets or exceeds all the requirements in **Appendix D, Contractor's Proposal**.

3.2 Software Licenses

As further articulated in this Agreement and as otherwise necessary to City's use of the System, Contractor shall provide City with certain end-user and administrative software. Contractor hereby grants City a nonexclusive, perpetual, irrevocable, worldwide, fully paid, royalty-free, license pursuant to **Appendix E, Contractor's Communications System Services Agreement and Software License Agreement** to use the deliverables for City's governmental purposes.

3.3 In Scope Services

The project scope includes the following services, described in detail in Appendix B, needed to upgrade the LAFD voice radio system infrastructure, including:

- Project Management
- System Design
- System Installation and Testing
- System Cut-Over
- System Training
- System Implementation
- System Warranty, Maintenance and Support
- As-Built System Documentation

3.4 Out of Scope Services

Unless mutually agreed to by both parties by way of an amendment to this Agreement, any services not specifically listed in this Agreement, are considered out of scope. The City shall not be responsible to pay Contractor for any out of scope work.

Contractor shall immediately notify the City in writing of any work that is requested to be performed that is outside of the original scope of work covered by this Agreement. If it is determined that the request is outside of the scope of work, Contractor shall not perform the requested work unless and until (i) the City's designated authority approves the request in writing and authorizes the use of any contingency funds for the work, and (ii) an amendment providing for an adjustment in Contractor's compensation, and the scope of work, is approved and executed by both parties.

4.0 Section 4: Compensation, Payment, Taxes, and Invoicing

4.1 Total Solution Cost.

Contractor shall provide the Voice Radio System solution (including one year of warranty support) as described in this Agreement, including **Appendix B, Scoping Statement of Work**, for a firm fixed price not to exceed $17,953,555.68, in accordance with the pricing details and payment milestones articulated in Section 9 of **Appendix B**.

4.2 Optional Post-Warranty Maintenance Support Cost.
At City's discretion, Contractor shall provide maintenance support as described in **Appendix B, Scoping Statement of Work**, for five (5) years, exercisable at City's option in one or more year increments, following (i) Full System Acceptance by the City and (ii) one year of warranty support. Contractor shall provide this maintenance support at costs not to exceed the prices for the corresponding year of post warranty support articulated in Section 9 of **Appendix B**, and for a cumulative price not to exceed $11,246,822 for five (5) years of maintenance support, provided City exercises its option to purchase maintenance support at or prior to Final System Acceptance.

4.3 Taxes

To the extent that any of the Services or Deliverables to be provided by Contractor hereunder are subject to any California sales and use taxes, City and Contractor acknowledge and agree that such taxes will be collected from the City. Contractor acknowledges and agrees to remit the same to the appropriate tax collection authorities in the manner set forth under applicable law. Contractor shall be solely responsible for any uncollected and unremitted taxes due and owing to the appropriate tax collection authorities and shall indemnify the City for any losses in connection with any uncollected and unremitted taxes due. Contractor acknowledges and agrees that the total compensation amount set forth is inclusive of all taxes that City will be responsible to pay under this Agreement and that Contractor shall be responsible for paying for any costs beyond the total compensation, regardless of whether such additional costs are the result of new or uncalculated additional taxes.

4.4 Invoicing

The Contractor shall submit their invoices to:

Name: S. Jenny Park
Title: Fire Administrator
Address: 200 N. Main Street, Room 1630
Los Angeles, CA 90012
Telephone: (213) 978-3731
Email: s.jenny.park@lacity.org

With copies to:

Name: Emilio Rodriguez, Jr.
Title: Chief Management Analyst
Address: 200 N. Main Street, Room 1630
Los Angeles, CA 90012
Telephone: (213) 978-3478
Email: emilio.rodriguez@lacity.org

And

Name: Carr Oduro

Title: Senior Systems Analyst
Address: 200 N. Main Street, Room 1680
Los Angeles, CA 90012
Telephone: (213) 922-7761
Email: carr.oduro@lacity.org

The City will make payment to the Contractor for the services performed within 45 days of receipt and approval of the invoices by the City's Representative. The City will not unreasonably withhold approval of invoices. In the event an invoice is not approved, the City's Representative will immediately send a notice to the Contractor setting forth therein the reasons said invoice was not approved. Upon receipt of such notice, the Contractor may re-invoice the City for the accepted portion of the invoice or cure the defects identified in the City Representative's notice. The City will pay the revised invoice as soon as practical after its submission. If the City's Representative contests all or a portion of the invoice, the City's representative and the Contractor will use their best efforts to resolve the disputed portion or portions of the invoice.

The invoice must contain the following:

a. Name and address of company or firm;
b. Name and address of the contracting department;
c. Date of the invoice and period covered;
d. Reference to contract number;
e. Description of the completed task and amount due for the task;
f. Copy of the invoices and payments to third parties, if any;
g. Payment terms, total due, and due date;
h. Certification by a duly authorized officer of the Contractor;
i. Discounts and terms (if applicable);
j. Remittance address (if different from company address); and
k. Percentage of maximum allowable compensation against which services have been billed to date, and percentage of maximum allowable compensation remaining.

All invoices shall be submitted on Contractor's letterhead, contain Contractor's official logo, if any, or contain other unique and identifying information such as name and address of Contractor. Evidence that tasks have been completed, in the form of a report (or progress report outlining work completed during the billing period), shall be attached to all invoices. Invoices shall be submitted within 30 days of performance of services. Invoices are considered complete when appropriate documentation or services provided are signed off as satisfactory by the Fire Chief or designee.

Invoices and supporting documentation shall be prepared at the sole expense and responsibility of Contractor. The Department will not compensate Contractor for any costs incurred for invoice preparation. The Department may request, in writing, changes to the content and format of the invoice and supporting documentation at any time. The Department reserves the right to request additional supporting documentation to

substantiate costs at any time.

Failure to adhere to these policies may result in nonpayment or non- approval of demands, pursuant to Charter 262(a), which requires the Controller to inspect the quality, quantity, and condition of services, labor, materials, supplies, or equipment received by any City office or department, and approve demands before they are drawn on the Treasury

5.0 Section 5: Representations and Warranties

5.1 In General.

The warranties in this section are nonexclusive and are cumulative of any other representations and warranties from Contractor in this Agreement, including but not limited to those warranties contained in the Appendices, or otherwise available to City under law.

5.2 Warranties of Function

5.2.1 Contractor represents and warrants that for one year following Final System Acceptance, the System will perform materially as described in the technical specifications set forth in the Appendices.

5.2.2 Contractor represents and warrants that, during the first year after Final System Acceptance, each component will perform materially according to its specification and documentation, as provided in Appendices.

5.2.3 Contractor represents and warrants that no component, when installed, will impair or degrade the Existing Radio System's performance, during the period from installation until Final System Acceptance.

5.2.4 The Contractor represents and warrants that any software products provided for the LAFD VRSSU shall be free from known defects or errors for the life of the Contract. The Contractor shall provide all necessary services to promptly correct any such defects at no cost to the City. This applies to the correction of "bugs," which may be found in the operating software. Software upgrades and enhancements, if requested by the City, may be negotiated with the Contractor at the time it is requested. The City reserves the right to deploy system-trained City technicians to perform emergency maintenance in coordination with the Contractor during the warranty period without voiding the terms of the warranty.

5.3 General Hardware Warranties

The Contractor shall warrant that all the equipment, work, and documentation supplied as part of this Agreement meet the following specification: Such work and equipment shall be free from defects in material and workmanship for a period of at least one (1) year from the date of Final System Acceptance. The Contractor shall provide all parts and labor needed during the warranty

period. All equipment supplied as part of this Agreement shall be new. Refurbished or remanufactured components will not be accepted.

5.4 Warranty of Originality

Contractor represents and warrants that the Work Product will be its own original work, without incorporation of software, text, images, or other assets created by third parties, except to the extent that City consents to such incorporation in writing.

5.4.1 Third-Party Software

Any third-party software provided by Contractor under this agreement will be subject to the terms and conditions of **Appendix E, Contractor's Communications System Services Agreement and Software License Agreement**.

5.5 Warranty of Authority

Contractor represents and warrants that it has the full right and authority to enter into, execute, and perform its obligations under this Agreement and that no pending or threatened claim or litigation known to it would have a material adverse impact on its ability to perform as required by this Agreement.

5.6 Deliverables

Contractor represents and warrants that any and all Deliverables shall at the time of delivery and acceptance conform to the applicable specifications; shall be free from any error, malfunction, or defect; shall be fit for the particular purpose for which the Deliverable is developed and of which City advises Contract; and if intended to serve as one or more components of an associated system, program, device, network or data, such Deliverable shall comply with the warranties and other requirements of this Agreement when integrated or used with the System

5.7 Pass through Warranties

Without limiting City's rights with respect to Contractor's warranties under this Agreement, if Contractor provides any Deliverables covered by a third-party manufacturer's warranty or indemnity, or both, Contractor shall: (i) provide City with a copy of each such warranty or indemnity; and (ii) if such warranty or indemnity does not by its terms pass through to the end-user, then to the extent permitted, Contractor shall assign to City or otherwise cause the manufacturer to grant to City all warranties and indemnities provided by such manufacturer.

5.8 Compliance with Law

Contractor represents and warrants that the services provide under this Agreement will comply with all applicable laws, including without limitation federal, state, and local.

5.9 Malicious Software

Contractor represents and warrants that the Software and any media used to distribute it contain no known viruses or other computer instructions or technological means intended to disrupt, damage, or interfere with the use of computers or related systems.

Contractor represents and warrants to City that all Software licensed hereunder does not contain any undisclosed disabling code (defined as computer code designed to interfere with the normal operation of the Software or Customer's hardware or software) other than that required for Contractor to provide updates and maintenance to City, or any program routine, device or other undisclosed feature, including but not limited to, a time bomb, virus, drop-dead device, malicious logic, worm, Trojan horse, or trap door which is designed to delete, disable, deactivate, interfere with or otherwise harm the software or Customer's hardware or software.

Contractor represents and warrants to City that: (a) Contractor has used its best efforts to scan for viruses within the Software, and (b) no known malicious System will be supplied under this Agreement.

5.10 System Security
Contractor represents and warrants that it will employ industry-standard or better protections to prevent unauthorized disclosure or exposure of sensitive or confidential information that City provides to the System.

5.11 The warranties set forth in this Section 5 do not apply to: (i) defects or damage resulting from: use of the equipment or software in other than its authorized manner; accident, liquids, neglect, or acts of God; testing, maintenance, disassembly, repair, installation, alteration, modification, or adjustment not provided or authorized in writing by Contractor; City's failure to comply with all applicable industry and OSHA standards; (ii) breakage of or damage to antennas unless caused directly by defects in material or workmanship; (iii) equipment that has had the serial number removed or made illegible; (iv) batteries (because they carry their own separate limited warranty) or consumables;; and (v) normal or customary wear and tear.

UNLESS OTHERWISE STATED IN AN APPLICABLE STATEMENT OF WORK, THESE WARRANTIES ARE THE COMPLETE WARRANTIES FOR THE EQUIPMENT AND CONTRACTOR SOFTWARE PROVIDED UNDER THIS AGREEMENT AND ARE GIVEN IN LIEU OF ALL OTHER WARRANTIES. CONTRACTOR DISCLAIMS ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

6.0 Section 6: City Contracting Requirements

6.1 Standard Provisions
Contractor agrees to, and shall comply with, the Standard Provisions for City Contracts (Rev. 10/21)[v.4], attached hereto as **Appendix A**, and incorporated by reference as though fully set forth herein, with the exception of the following provisions, the subject matter of which are otherwise addressed in this Agreement: PSC-8, PSC-9(B)(6), PSC-12, PSC-13, PSC-18, PSC-19, PSC-20, PSC-21, PSC-22, PSC-24, PSC-39, and PSC-40.

6.2 Disclosure of Border Wall Contracting Ordinance
Contractor shall comply with Los Angeles Administrative Code (LAAC) Section 10.50 *et seq*., "Disclosure of Border Wall Contracting Ordinance." City may terminate this

Agreement at any time if City determines that Contractor failed to fully and accurately complete the required affidavit and disclose all Border Wall Bids and Border Wall Contracts, as defined in LAAC Section 10.50.1.

6.3 Assignment and Delegation

Contractor may not, unless it has first obtained the written permission of City:
A. Assign or otherwise alienate any of its rights under this Agreement, including the right to payment; or
B. Delegate, subcontract, or otherwise transfer any of its duties under this Contract.
C. Written permission of City for Contractor's assignment will not be unreasonably withheld.

6.4 Permits

Unless otherwise set forth in the applicable Statement of Work Contractor and its directors, officers, partners, agents, employees, and Subcontractors, shall obtain and maintain all licenses, permits, certifications and other documents necessary for Contractor's performance of this Contract. Contractor shall immediately notify City of any suspension, termination, lapses, non-renewals, or restrictions of licenses, permits, certificates, or other documents that relate to Contractor's performance of this Contract.

6.5 Indemnification

Except for the active negligence or willful misconduct of City, or any of its boards, officers, agents, employees, assigns and successors in interest, Contractor shall defend, indemnify and hold harmless City and any of its boards, officers, agents, employees, assigns, and successors in interest from and against all lawsuits and causes of action, claims, losses, demands and expenses, including, but not limited to, attorney's fees (both in house and outside counsel) and cost of litigation (including all actual litigation costs incurred by City, including but not limited to, costs of experts and consultants), damages or liability of any nature whatsoever, for death or injury to any person, including Contractor's employees and agents, or damage or destruction of any tangible property of either party hereto or of third parties, to the extent arising in any manner by reason of a negligent act, error, or omission by Contractor, Subcontractors, or their boards, officers, agents, employees, assigns, and successors in interest. The rights and remedies of City provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract. This provision will survive expiration or termination of this Contract.

6.6 Intellectual Property Indemnification

Contractor, at its own expense, shall defend, indemnify, and hold harmless the City, and any of its boards, officers, agents, employees, assigns, and successors in interest from and against all lawsuits and causes of action, claims, losses, demands and expenses, including, but not limited to, attorney's fees (both in house and outside counsel) and cost of litigation (including all actual litigation costs incurred by City, including but not limited to, costs of experts and consultants),

damages or liability of any nature arising out of the infringement, actual or alleged, direct or contributory, of any intellectual property rights, including, without limitation, any United States patent, copyright, trademark, right of publicity, and proprietary information ("Infringement Claim"): (1) on or in any design, medium, matter, article, process, method, application, equipment, device, instrumentation, software, hardware, or firmware used by Contractor, or its Subcontractors, in performing the work under this Contract ("Contractor Product"); or (2) as a result of City's actual or intended use of any Work Product (as defined in PSC-21) furnished by Contractor, or its Subcontractors, under this Contract. The rights and remedies of City provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract. This provision will survive expiration or termination of this Contract.

If an Infringement Claim occurs, or in Contractor's opinion is likely to occur, Contractor may at its option and expense: (a) procure for City the right to continue using the Contractor Product; (b) replace or modify the Contractor Product so that it becomes non-infringing while providing functionally equivalent performance.

Contractor will have no duty to defend or indemnify for any Infringement Claim that is based upon: (a) the unintended combination of the Contractor Product with any software, apparatus or device not furnished by Contractor, but solely to the extent: (1) such combination causes the infringement and (2) the infringement claim results from such combination; (b) the unauthorized use of ancillary equipment or software not furnished by Contractor and that is attached to or used in connection with the Contractor Product, but solely to the extent: (1) such use causes the infringement and (2) the infringement claim results from such use; (c) Contractor Product designed or manufactured in accordance with City's designs, specifications, guidelines or instructions, if the alleged infringement would not have occurred without such designs, specifications, guidelines or instructions; (d) an unauthorized modification of the Contractor Product by a party other than Contractor but solely to the extent: (1) such modification causes the infringement and (2) the infringement claim results from such modification; (e) use of the Contractor Product in a manner for which the Contractor Product was not designed or that is inconsistent with the terms of this Agreement, but solely to the extent (1) such use causes the infringement and (2) the infringement claim results from such use; or (f) the failure by City to install an enhancement release to the Contractor Software that is intended to correct the claimed infringement, but solely to the extent that: (1) Contractor has notified City in writing that use of the update would have avoided the claim, (2) the enhancement release correcting the infringement is provided to City free of charge, and (3) the enhancement does not result in a material diminution in the functionality of the Contractor Software or Contractor Product. .

This Section provides City's sole and exclusive remedies and Contractor's entire liability in the event of an Infringement Claim. City has no right to recover and Contractor has no obligation to provide any other or further remedies, whether under another provision of this Agreement or any other legal theory or principle, in connection with an Infringement Claim. In addition, the rights and remedies provided in this Section are subject to and limited by any liability limits set forth herein.

6.7 Limitation of Liability.

Except for personal injury or death, Contractor's total liability, whether for breach of contract, warranty, negligence, strict liability in tort, indemnification, or otherwise, will be limited to the direct damages recoverable under law, but not to exceed three times (3x) the price of the equipment, software, or implementation and other one-time services with respect to which losses or damages are claimed. With respect to all subscription or other ongoing services, Contractor's total liability will be limited to the direct damages recoverable under law, but not to exceed the price of eighteen (18) months of Services preceding the incident giving rise to the claim. ALTHOUGH THE PARTIES ACKNOWLEDGE THE POSSIBILITY OF SUCH LOSSES OR DAMAGES, THEY AGREE THAT CONTRACTOR WILL NOT BE LIABLE FOR ANY COMMERCIAL LOSS, INCONVENIENCE, LOSS OF USE, LOSS TIME, DATA, GOODWILL, REVENUES, PROFITS OR SAVINGS; OR OTHER SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES IN ANY WAY RELATED TO OR ARISING FROM THIS AGREEMENT, THE SALE OR USE OF THE EQUIPMENT OR SOFTWARE, OR THE PERFORMANCE OF SERVICES BY CONTRACTOR PURSUANT TO THIS AGREEMENT.

6.8 Ownership and License

All documentary deliverables and other materials that are promised deliverables under this Agreement and the applicable order shall become City property, title will transfer and risk of loss shall occur, upon the date of delivery and payment therefor (except for Software, if any, which is licensed), but no transfer of Contractor's or City's intellectual property rights will occur. As between the parties, City is the sole and exclusive owner of all data and information provided to Contractor by or on behalf of City pursuant to this Agreement and any and all updates or modifications thereto or derivatives thereof made by Contractor ("City Data"), and all intellectual property rights in the foregoing, whether or not provided to any other party under this Agreement. City Data is Confidential Information for the purposes of this Agreement.

Contractor shall not use City Data for any purpose other than that of rendering the services under this Agreement, nor sell, assign, lease, dispose of or otherwise exploit City Data. Contractor shall not possess or assert any lien or other right against, or to City Data. City may request an export of City Data stored within the systems or held by Contractor in any form or format at no charge to City.

Subject to the restrictions articulated elsewhere in this Agreement, City grants Contractor a non-transferable, non-exclusive, terminable at-will license, solely for the term of this Agreement, to use City Data solely for purposes of performing the services pursuant to this Agreement for City's benefit. This section is in lieu of PSC-21.

6.9 Data Protection

A. Contractor shall protect, using no less than the most secure means and technology that is commercially available and standard for public safety communications, City-provided data or consumer-provided data acquired in the course and scope of this Contract, including but not limited to customer lists and customer credit card or consumer data, (collectively, the "City

Data"). Contractor shall notify City in writing as soon as reasonably feasible, and in any event within forty-eight hours, of Contractor's discovery of any unauthorized access of City Data (a "Data Breach"), or of any incident affecting, or potentially affecting City Data related to cyber security (a "Security Incident"), including, but not limited to, denial of service attack, and system outage, instability or degradation due to computer malware or virus. Contractor shall begin remediation immediately. Contractor shall provide daily updates, or more frequently if required by City, regarding findings and actions performed by Contractor until the Data Breach or Security Incident has been effectively resolved to City's satisfaction. Contractor shall conduct an investigation of the Data Breach or Security Incident and shall share the report of the investigation with City. At City's sole discretion, City and its authorized agents shall have the right to participate in the investigation. Contractor shall cooperate fully with City, its agents and law enforcement.

B. Except where the liability is primarily attributable to the City's negligence, if City is subject to liability for any Data Breach or Security Incident, then Contractor shall fully indemnify and hold harmless City and defend against any resulting actions.

6.10 Best Terms

Contractor makes no representations or commitments concerning the pricing or discounts for the services to be provided hereunder, except as set forth in Section 4 above and **Appendix B** to this Agreement. Notwithstanding the preceding sentence, if City becomes aware of any of its orders under this Agreement that is substantially similar in time frame and nature to another service transaction with a different Motorola state or local governmental customer in the United States where that other customer received more favorable pricing, then City may notify Contractor of the other substantially similar transaction with more favorable pricing. Upon receipt of such notice, Contractor will investigate the matter, and thereafter the Parties will meet and confer to discuss the matter. Based upon that meet and confer process, if a differential in pricing does exist, Contractor will make an appropriate reduction in the pricing for City's order in the form of a credit to be used against future purchases. In addition, Contractor may but is not obligated to provide additional or other discounts (e.g., large order) to City concerning any order.

6.11 Limitation of City's Obligation to Make Payment to Contractor

Notwithstanding any other provision of this Contract, including any appendicies or attachments incorporated therein, and in order for City to comply with its governing legal requirements, City shall have no obligation to make any payments to Contractor unless City shall have first made an appropriation of funds equal to or in excess of its obligation to make any payments as provided in this Contract. Contractor agrees that any services provided by Contractor, purchases made by Contractor or expenses incurred by Contractor in excess of the appropriation(s) shall be free and without charge to City and City shall have no obligation to pay for the services, purchases or expenses. Contractor shall have no obligation to provide any services, provide any equipment or incur any expenses in excess of the appropriated amount(s) until City appropriates additional funds for this Contract.

6.12 Compliance with Identity Theft Laws and Payment Card Data Security Standards

Contractor shall comply with all applicable identity theft laws including without limitation, laws related to: (1) payment devices; (2) credit and debit card fraud; and (3) the Fair and Accurate Credit Transactions Act ("FACTA"), including its requirement relating to the content of transaction receipts provided to Customers. Contractor also shall comply with all requirements related to maintaining compliance with Payment Card Industry Data Security Standards ("PCI DSS"). During the performance of any service to install, program or update payment devices equipped to conduct credit or debit card transactions, including PCI DSS services, Contractor shall verify proper truncation of receipts in compliance with FACTA.

7.0 Prevailing wage requirements

7.1 Prevailing Wage Requirements

7.1.1 Prevailing Wages must be paid on all City of Los Angeles public works projects when the work is for construction, alteration, demolition, installation, maintenance or repair when the work is done under Agreement and paid for in whole or in part out of public funds.

7.1.1.1 The Contractor and all subcontractors shall comply with all provisions of the California Labor Code relating to public works wages, and in specific, with Sections 1720-1861 of the Code requiring the Contractor to pay not less than the "General Prevailing Wage Rates" to all workers employed during the work. The prevailing wage rate is established by the State of California's Department of Industrial Relations. Information regarding prevailing wage rates may be obtained from the Office of Policy, Research and Legislation, Prevailing Wage Unit, P.O. Box 420603, San Francisco, CA 94142, Telephone (415) 972-8628, Fax (415) 972-8640, or for a copy of the prevailing wage rates, contact the Office of Contract Compliance at (213) 847-2636.

7.1.1.2 Any contract awarded hereunder will require the Contractor and all subcontractors to comply with the provisions of the Labor Code of the State of California, relating to Public Works wages. These provisions require the Contractor to pay not less than the "General Prevailing Wage Rates" to all workers employed in the execution of the contract and to post a copy of the "General Prevailing Wage Rates" at the job-site, in a conspicuous place available to all employees and applicants for employment.

7.1.1.3 The Contractor and all subcontractors shall submit Certified Payroll Records to the Office of Contract Compliance on a weekly basis using the City's On-Line Certified Payroll System (OCPS) throughout the project until completion of the project. In addition, the Contractor and all subcontractors shall employ apprentices in the ratio to journeymen as required by Section 1777.5 of the California Labor Code.

7.1.2 Pursuant to Section 1776 of the California Labor Code:

7.1.2.1 The Contractor must keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours

worked each day and week, and the actual per diem wages paid to each worker or other employee employed by the Contractor.

7.1.2.2 All payroll records shall be available for inspection at all reasonable hours at the principal office of the Contractor upon request by the City.

7.1.3 Joint Labor Compliance Monitoring Program

The City has a Joint Labor Compliance Monitoring Program to assist in ensuring that the proper Prevailing Wage Rates are paid to all workers employed on the City's public works projects.

7.1.3.1 The Contractor and all subcontractors shall cooperate in allowing approved Compliance Group Representatives access to the project job site for the purpose of conducting worker interviews to insure compliance with the requirement to pay proper prevailing wages on City projects. This will be done in order to comply with the Board of Public Works' adoption of a Joint Labor Compliance Monitoring Program.

7.1.3.2 Each Compliance Group Representative must wear their City-issued Joint Labor Compliance Monitoring Program identification badge at all times while on the job site, and must restrict their actions to interviewing workers employed on the project. For a copy of the Joint Labor Compliance Monitoring Program board report, or for any questions, contact the Office of Contract Compliance at (213) 847-2675.

8.0 Miscellaneous

8.1 Non-Exclusive Agreement

City and Contractor understand and agree that this is a non-exclusive Agreement to provide services to the City and that the City reserves the right to enter into an agreement with other contractors to provide similar services during the term of this Agreement.

8.2 Not a Waiver

Contractor acknowledges and agrees that nothing contained in this Agreement is, represents, or is intended to be construed as a release, compromise, settlement, or waiver by City of any cause of action that City may have against Contractor. City reserves its rights in full, including, but not limited to, the right to bring any claim, cause of action, or request for reimbursement against Contractor in relation to this Agreement and other transactions between City and Contractor.

8.3 Audit Rights

In addition to those rights available to City pursuant to PSC-16, Retention of Records, Audit and Reports, Contractor shall provide City or City's duly authorized representatives access, for the purposes of audit and investigation, to any and all books, documents, papers, records,

deliverables, and software documentation pertaining to any past, current, or future (i) transactions between City and Contractor, (ii) work requested to be performed of Contractor, or (iii) demands for payment by Contractor. Contractor further agrees to maintain such records for a period of three (3) years after final payment under the Contract.

8.4 Payment Does Not Imply Acceptance of Work

The granting of any payment by City or the receipt thereof by Contractor, in no way lessens the liability of Contractor to replace unsatisfactory work, equipment, or materials although the unsatisfactory character of this work, equipment or materials may not have been apparent or detected at the time the payment was made. Materials, equipment, components, or workmanship that do not conform to the requirements of this Agreement may be rejected by City and upon rejection must be replaced by Contractor without delay.

8.5 Name Change

In the event that Contractor undergoes either an ownership change and the new Owner is able to comply with all Agreement terms and conditions, or a name change, the General Manager of the ITA may, at his discretion, execute an amendment to effect the assumption and/or change the Contractor name.

8.6 Subcontracting

8.6.1 Restriction on Disbursements to Subcontractors

If applicable, no money received pursuant to this Agreement by the Contractor shall be disbursed to any subcontractor except pursuant to a written agreement which incorporates the applicable provisions of this Agreement and unless the subcontractor is in compliance with City requirements with regard to accounting and fiscal matters, to the extent that they are applicable.

8.6.2 Records and Audits of Subcontracts

8.6.2.1 Records shall be maintained in accordance with requirements prescribed by the City with respect to all matters covered by any subcontract. Such records shall be retained within the Los Angeles Area for a period of five (5) years after receipt of final payment under this Agreement, unless authorization to remove them is granted in writing by the City.

8.6.2.2 Expenditures pertaining to subcontracts shall be supported by properly executed documents evidencing in detail the nature of the charges.

8.6.2.3 At such times and in such forms as the City may require, there shall be furnished to the City such statements, records, reports, data and information as the City may request pertaining to matters covered by any subcontract.

8.6.2.4 These records shall be made available to the City for copying, audit, and inspection at any time during normal business hours.

8.7 Contractor Performance Evaluation

At the end of this Contract, the City will conduct an evaluation of the Contractor's performance. The City may also conduct evaluations of the Contractor's performance during the term of the Contract. As required by Section 10.39.2 of the Los Angeles Administrative Code, evaluations will be based on a number of criteria, including the quality of the work product or service performed, the timeliness of performance, financial issues, and the expertise of personnel that the Contractor assigns to the Contract. A Contractor who receives a "Marginal" or "Unsatisfactory" rating will be provided with a copy of the final City Evaluation and allowed 14 calendar days to respond. The City will use the final City evaluation and any response from the Contractor to evaluate proposals and to conduct reference checks when awarding other personal services contracts.

8.8 Counterparts and Electronic Signatures

This Agreement may be executed in one or more counterparts, and by the parties in separate counterparts, each of which when executed shall be deemed to be an original but all of which taken together shall constitute one and the same agreement. The parties further agree that facsimile signatures or signatures scanned into .pdf (or signatures in another electronic format designated by City) and sent by e-mail shall be deemed original signatures.

8.9 Order of Precedence

This Agreement, and any appendicies, attachments or documents incorporated herein by inclusion or by reference constitutes the complete and entire Agreement between the City and the Contractor. In the event of any inconsistency between the body of this Agreement and the Attachments, the order of precedence will be as follows:

1) This Agreement between the City and Motorola Solutions, Inc.
2) Appendix A – Standard Provisions for City Contracts (Rev. 10/21)[v.4]
3) Appendix B – Scoping Statement of Work
4) Appendix C – High-Level Specifications
5) Appendix D – Contractor Proposal, dated April 6, 2022, provided, however, that in the event of any inconsistency between Appendix D and Appendix B or Appendix C, the following Sections of Appendix D shall take precedence:
    - Section 2.7: 800MHz Analog VRS Radio System
    - Section 2.8: Preliminary Cutover Plan
    - Section 3: DC Power Upgrades & Tower Studies
    - Section 4.1: Dispatch Console Configuration for LAFD
    - Section 4.4: Deployment Options
    - Section 4.7: LAFD's Proposed Configuration
    - Section 5: Logging Recorder
    - Section 7: System Network Requirements
    - Section 9: Design Assumptions
    - Section 11: Statement of Work

- Section 13: Functional Acceptance Test Plan
- Section 14: Coverage Acceptance Test Plan (CATP)
- Section 17: ASTRO® 25 Services Statement of Work

6) Appendix E – Contractor's Communications System Services Agreement and Software License Agreement.

8.10 Entire Agreement

This Agreement contains the full and complete Agreement between the parties. No verbal agreement or conversation with any officer or employee of either party shall affect or modify any of the terms and conditions of this Agreement. No-shrink-wrap, click-wrap, privacy policy, or other terms and conditions or agreements ("Additional Contractor Software Terms") provided with any products, services, documentation, or software hereunder shall be binding on City, even if use of the foregoing requires an affirmative "acceptance" of those Additional Contractor Software Terms before access is permitted. All such Additional Contractor Software Terms shall be of no force or effect and shall be deemed rejected by City in their entirety.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS THEREOF, the parties hereto have caused this instrument to be signed by their respective duly authorized officers:

THE CITY OF LOS ANGELES

By: _____
KRISTIN M. CROWLEY
Fire Chief
Los Angeles Fire Department

Date: _____

MOTOROLA SOLUTIONS, INC.

By: _____
Name: _____
Title: _____

Date: _____

By: _____
Name: _____
Title: _____

Date: _____

APPROVED AS TO FORM:
MICHAEL N. FEUER, City Attorney

By: _____
SAMUEL W. PETTY
Deputy City Attorney

Date: _____

ATTEST:
HOLLY L. WOLCOTT, City Clerk

By: _____
Deputy City Clerk

Date: _____

City Agreement Number: _____

APPENDIX A

STANDARD PROVISIONS FOR CITY CONTRACTS (Rev. 10/21)[v.4]

STANDARD PROVISIONS FOR CITY CONTRACTS

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

STANDARD PROVISIONS FOR CITY CONTRACTS

PSC-1. Construction of Provisions and Titles Herein

All titles, subtitles, or headings in this Contract have been inserted for convenience, and shall not be deemed to affect the meaning or construction of any of the terms or provisions of this Contract. The language of this Contract shall be construed according to its fair meaning and not strictly for or against **CITY** or **CONTRACTOR**. The word "**CONTRACTOR**" includes the party or parties identified in this Contract. The singular shall include the plural and if there is more than one **CONTRACTOR**, unless expressly stated otherwise, their obligations and liabilities shall be joint and several. Use of the feminine, masculine, or neuter genders shall be deemed to include the genders not used.

PSC-2. Applicable Law, Interpretation and Enforcement

Each party's performance shall comply with all applicable laws of the United States of America, the State of California, and **CITY**, including but not limited to, laws regarding health and safety, labor and employment, wage and hours and licensing. This Contract shall be enforced and interpreted under the laws of the State of California without regard to conflict of law principles. **CONTRACTOR** shall comply with new, amended, or revised laws, regulations, or procedures that apply to the performance of this Contract with no additional compensation paid to **CONTRACTOR**.

In any action arising out of this Contract, **CONTRACTOR** consents to personal jurisdiction, and agrees to bring all such actions, exclusively in state or federal courts located in Los Angeles County, California.

If any part, term or provision of this Contract is held void, illegal, unenforceable, or in conflict with any federal, state or local law or regulation, the validity of the remaining parts, terms or provisions of this Contract shall not be affected.

PSC-3. Time of Effectiveness

Unless otherwise provided, this Contract shall take effect when all of the following events have occurred:

A. This Contract has been signed on behalf of **CONTRACTOR** by the person or persons authorized to bind **CONTRACTOR**;

B. This Contract has been approved by the City Council or by the board, officer or employee authorized to give such approval;

C. The Office of the City Attorney has indicated in writing its approval of this Contract as to form; and

D. This Contract has been signed on behalf of **CITY** by the person designated by the City Council, or by the board, officer or employee authorized to enter into this Contract.

PSC-4. Integrated Contract

This Contract sets forth all of the rights and duties of the parties with respect to the subject matter of this Contract, and replaces any and all previous Contracts or understandings, whether written or oral, relating thereto. This Contract may be amended only as provided for in the provisions of PSC-5 hereof.

PSC-5. Amendment

All amendments to this Contract shall be in writing and signed and approved pursuant to the provisions of PSC-3.

PSC-6. Excusable Delays

Neither party shall be liable for its delay or failure to perform any obligation under and in accordance with this Contract, if the delay or failure arises out of fires, floods, earthquakes, epidemics, quarantine restrictions, other natural occurrences, strikes, lockouts (other than a lockout by the party or any of the party's Subcontractors), freight embargoes, terrorist acts, insurrections or other civil disturbances, or other similar events to those described above, but in each case the delay or failure to perform must be beyond the control and without any fault or negligence of the party delayed or failing to perform (these events are referred to in this provision as "Force Majeure Events").

Notwithstanding the foregoing, a delay or failure to perform by a Subcontractor of **CONTRACTOR** shall not constitute a Force Majeure Event, unless the delay or failure arises out of causes beyond the control of both **CONTRACTOR** and Subcontractor, and without any fault or negligence of either of them. In such case, **CONTRACTOR** shall not be liable for the delay or failure to perform, unless the goods or services to be furnished by the Subcontractor were obtainable from other sources in sufficient time to permit **CONTRACTOR** to perform timely. As used in this Contract, the term "Subcontractor" means a subcontractor at any tier.

In the event **CONTRACTOR'S** delay or failure to perform arises out of a Force Majeure Event, **CONTRACTOR** agrees to use commercially reasonable best efforts to obtain the goods or services from other sources, and to otherwise mitigate the damages and reduce the delay caused by the Force Majeure Event.

PSC-7. Waiver

A waiver of a default of any part, term or provision of this Contract shall not be construed as a waiver of any succeeding default or as a waiver of the part, term or provision itself. A party's performance after the other party's default shall not be construed as a waiver of that default.

PSC-8. Suspension

At **CITY'S** sole discretion, **CITY** may suspend any or all services provided under this Contract by providing **CONTRACTOR** with written notice of suspension. Upon receipt of the notice of suspension, **CONTRACTOR** shall immediately cease the services suspended and shall not incur any additional obligations, costs or expenses to **CITY** until **CITY** gives written notice to recommence the services.

PSC-9. Termination

A. Termination for Convenience

CITY may terminate this Contract for **CITY'S** convenience at any time by providing **CONTRACTOR** thirty days written notice. Upon receipt of the notice of termination, **CONTRACTOR** shall immediately take action not to incur any additional obligations, costs or expenses, except as may be necessary to terminate its activities. **CITY** shall pay **CONTRACTOR** its reasonable and allowable costs through the effective date of termination and those reasonable and necessary costs incurred by **CONTRACTOR** to effect the termination. Thereafter, **CONTRACTOR** shall have no further claims against **CITY** under this Contract. All finished and unfinished documents and materials procured for or produced under this Contract, including all intellectual property rights **CITY** is entitled to, shall become **CITY** property upon the date of the termination. **CONTRACTOR** agrees to execute any documents necessary for **CITY** to perfect, memorialize, or record **CITY'S** ownership of rights provided herein.

B. Termination for Breach of Contract

1. Except as provided in PSC-6, if **CONTRACTOR** fails to perform any of the provisions of this Contract or so fails to make progress as to endanger timely performance of this Contract, **CITY** may give **CONTRACTOR** written notice of the default. **CITY'S** default notice will indicate whether the default may be cured and the time period to cure the default to the sole satisfaction of **CITY**. Additionally, **CITY'S** default notice may offer **CONTRACTOR** an opportunity to provide **CITY** with a plan to cure the default, which shall be submitted to **CITY** within the time period allowed by **CITY**. At **CITY'S** sole discretion, **CITY** may accept or reject **CONTRACTOR'S** plan. If the default cannot be cured or if **CONTRACTOR** fails to cure within the period allowed by **CITY**, then **CITY** may terminate this Contract due to **CONTRACTOR'S** breach of this Contract.

2. If the default under this Contract is due to **CONTRACTOR'S** failure to maintain the insurance required under this Contract, **CONTRACTOR** shall immediately: (1) suspend performance of any services under this Contract for which insurance was required; and (2) notify its employees and Subcontractors of the loss of insurance coverage and Contractor's obligation to suspend performance of

services. **CONTRACTOR** shall not recommence performance until **CONTRACTOR** is fully insured and in compliance with **CITY'S** requirements.

3. If a federal or state proceeding for relief of debtors is undertaken by or against **CONTRACTOR**, or if **CONTRACTOR** makes an assignment for the benefit of creditors, then **CITY** may immediately terminate this Contract.

4. If **CONTRACTOR** engages in any dishonest conduct related to the performance or administration of this Contract or violates **CITY'S** laws, regulations or policies relating to lobbying, then **CITY** may immediately terminate this Contract.

5. Acts of Moral Turpitude

   a. **CONTRACTOR** shall immediately notify **CITY** if **CONTRACTOR** or any Key Person, as defined below, is charged with, indicted for, convicted of, pleads nolo contendere to, or forfeits bail or fails to appear in court for a hearing related to, any act which constitutes an offense involving moral turpitude under federal, state, or local laws ("Act of Moral Turpitude").

   b. If **CONTRACTOR** or a Key Person is convicted of, pleads nolo contendere to, or forfeits bail or fails to appear in court for a hearing related to, an Act of Moral Turpitude, **CITY** may immediately terminate this Contract.

   c. If **CONTRACTOR** or a Key Person is charged with or indicted for an Act of Moral Turpitude, **CITY** may terminate this Contract after providing **CONTRACTOR** an opportunity to present evidence of **CONTRACTOR'S** ability to perform under the terms of this Contract.

   d. Acts of Moral Turpitude include, but are not limited to: violent felonies as defined by Penal Code Section 667.5, crimes involving weapons, crimes resulting in serious bodily injury or death, serious felonies as defined by Penal Code Section 1192.7, and those crimes referenced in the Penal Code and articulated in California Public Resources Code Section 5164(a)(2); in addition to and including acts of murder, rape, sexual assault, robbery, kidnapping, human trafficking, pimping, voluntary manslaughter, aggravated assault, assault on a peace officer, mayhem, fraud, domestic abuse, elderly abuse, and child abuse, regardless of whether such acts are punishable by felony or misdemeanor conviction.

e. For the purposes of this provision, a Key Person is a principal, officer, or employee assigned to this Contract, or owner (directly or indirectly, through one or more intermediaries) of ten percent or more of the voting power or equity interests of **CONTRACTOR**.

6. In the event **CITY** terminates this Contract as provided in this section, **CITY** may procure, upon such terms and in the manner as **CITY** may deem appropriate, services similar in scope and level of effort to those so terminated, and **CONTRACTOR** shall be liable to **CITY** for all of its costs and damages, including, but not limited to, any excess costs for such services.

7. If, after notice of termination of this Contract under the provisions of this section, it is determined for any reason that **CONTRACTOR** was not in default under the provisions of this section, or that the default was excusable under the terms of this Contract, the rights and obligations of the parties shall be the same as if the notice of termination had been issued pursuant to PSC-9(A) Termination for Convenience.

8. The rights and remedies of **CITY** provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

C. In the event that this Contract is terminated, **CONTRACTOR** shall immediately notify all employees and Subcontractors, and shall notify in writing all other parties contracted with under the terms of this Contract within five working days of the termination.

PSC-10. Independent Contractor

CONTRACTOR is an independent contractor and not an agent or employee of **CITY**. **CONTRACTOR** shall not represent or otherwise hold out itself or any of its directors, officers, partners, employees, or agents to be an agent or employee of **CITY**.

PSC-11. Contractor's Personnel

Unless otherwise approved by **CITY**, **CONTRACTOR** shall use its own employees to perform the services described in this Contract. **CITY** has the right to review and approve any personnel who are assigned to work under this Contract. **CONTRACTOR** shall remove personnel from performing work under this Contract if requested to do so by **CITY**.

CONTRACTOR shall not use Subcontractors to assist in performance of this Contract without the prior written approval of **CITY**. If **CITY** permits the use of Subcontractors, **CONTRACTOR** shall remain responsible for performing all aspects of this Contract and paying all Subcontractors. **CITY** has the right to approve **CONTRACTOR'S** Subcontractors, and **CITY** reserves the right to request replacement of any

Subcontractor. **CITY** does not have any obligation to pay **CONTRACTOR'S** Subcontractors, and nothing herein creates any privity of contract between **CITY** and any Subcontractor.

PSC-12. Assignment and Delegation

CONTRACTOR may not, unless it has first obtained the written permission of **CITY**:

A. Assign or otherwise alienate any of its rights under this Contract, including the right to payment; or

B. Delegate, subcontract, or otherwise transfer any of its duties under this Contract.

PSC-13. Permits

CONTRACTOR and its directors, officers, partners, agents, employees, and Subcontractors, shall obtain and maintain all licenses, permits, certifications and other documents necessary for **CONTRACTOR'S** performance of this Contract. **CONTRACTOR** shall immediately notify **CITY** of any suspension, termination, lapses, non-renewals, or restrictions of licenses, permits, certificates, or other documents that relate to **CONTRACTOR'S** performance of this Contract.

PSC-14. Claims for Labor and Materials

CONTRACTOR shall promptly pay when due all amounts owed for labor and materials furnished in the performance of this Contract so as to prevent any lien or other claim under any provision of law from arising against any **CITY** property (including reports, documents, and other tangible or intangible matter produced by **CONTRACTOR** hereunder), and shall pay all amounts due under the Unemployment Insurance Act or any other applicable law with respect to labor used to perform under this Contract.

PSC-15. Current Los Angeles City Business Tax Registration Certificate Required

For the duration of this Contract, **CONTRACTOR** shall maintain valid Business Tax Registration Certificate(s) as required by **CITY'S** Business Tax Ordinance, Section 21.00 *et seq*. of the Los Angeles Municipal Code ("LAMC"), and shall not allow the Certificate to lapse or be revoked or suspended.

PSC-16. Retention of Records, Audit and Reports

CONTRACTOR shall maintain all records, including records of financial transactions, pertaining to the performance of this Contract, in their original form or as otherwise approved by **CITY**. These records shall be retained for a period of no less than three years from the later of the following: (1) final payment made by **CITY**, (2) the expiration of this Contract or (3) termination of this Contract. The records will be subject to examination and audit by authorized **CITY** personnel or **CITY'S** representatives at any time. **CONTRACTOR** shall provide any reports requested by **CITY** regarding

performance of this Contract. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

In lieu of retaining the records for the term as prescribed in this provision, **CONTRACTOR** may, upon **CITY'S** written approval, submit the required information to **CITY** in an electronic format, e.g. USB flash drive, at the expiration or termination of this Contract.

PSC-17. Bonds

All bonds required by **CITY** shall be filed with the Office of the City Administrative Officer, Risk Management for its review and acceptance in accordance with Los Angeles Administrative Code ("LAAC") Sections 11.47 *et seq*., as amended from to time.

PSC-18. Indemnification

Except for the active negligence or willful misconduct of **CITY**, or any of its boards, officers, agents, employees, assigns and successors in interest, **CONTRACTOR** shall defend, indemnify and hold harmless **CITY** and any of its boards, officers, agents, employees, assigns, and successors in interest from and against all lawsuits and causes of action, claims, losses, demands and expenses, including, but not limited to, attorney's fees (both in house and outside counsel) and cost of litigation (including all actual litigation costs incurred by **CITY**, including but not limited to, costs of experts and consultants), damages or liability of any nature whatsoever, for death or injury to any person, including **CONTRACTOR'S** employees and agents, or damage or destruction of any property of either party hereto or of third parties, arising in any manner by reason of an act, error, or omission by **CONTRACTOR,** Subcontractors, or their boards, officers, agents, employees, assigns, and successors in interest. The rights and remedies of **CITY** provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract. This provision will survive expiration or termination of this Contract.

PSC-19. Intellectual Property Indemnification

CONTRACTOR, at its own expense, shall defend, indemnify, and hold harmless the **CITY**, and any of its boards, officers, agents, employees, assigns, and successors in interest from and against all lawsuits and causes of action, claims, losses, demands and expenses, including, but not limited to, attorney's fees (both in house and outside counsel) and cost of litigation (including all actual litigation costs incurred by **CITY**, including but not limited to, costs of experts and consultants), damages or liability of any nature arising out of the infringement, actual or alleged, direct or contributory, of any intellectual property rights, including, without limitation, patent, copyright, trademark, trade secret, right of publicity, and proprietary information: (1) on or in any design, medium, matter, article, process, method, application, equipment, device, instrumentation, software, hardware, or firmware used by **CONTRACTOR**, or its Subcontractors, in performing the work under this Contract; or (2) as a result of **CITY'S** actual or intended use of any Work Product (as defined in PSC-21) furnished by **CONTRACTOR**, or its Subcontractors, under this Contract. The rights and remedies of **CITY** provided in this section shall not be exclusive

and are in addition to any other rights and remedies provided by law or under this Contract. This provision will survive expiration or termination of this Contract.

PSC-20. Intellectual Property Warranty

CONTRACTOR represents and warrants that its performance of all obligations under this Contract does not infringe in any way, directly or contributorily, upon any third party's intellectual property rights, including, without limitation, patent, copyright, trademark, trade secret, right of publicity and proprietary information.

PSC-21. Ownership and License

Unless otherwise provided for herein, all finished and unfinished works, tangible or not, created under this Contract including, without limitation, documents, materials, data, reports, manuals, specifications, artwork, drawings, sketches, blueprints, studies, memoranda, computation sheets, computer programs and databases, schematics, photographs, video and audiovisual recordings, sound recordings, marks, logos, graphic designs, notes, websites, domain names, inventions, processes, formulas, matters and combinations thereof, and all forms of intellectual property originated and prepared by **CONTRACTOR** or its Subcontractors under this Contract (each a "Work Product"; collectively "Work Products") shall be and remain the exclusive property of **CITY** for its use in any manner **CITY** deems appropriate. **CONTRACTOR** hereby assigns to **CITY** all goodwill, copyright, trademark, patent, trade secret and all other intellectual property rights worldwide in any Work Products originated and prepared under this Contract. **CONTRACTOR** further agrees to execute any documents necessary for **CITY** toperfect, memorialize, or record **CITY'S** ownership of rights provided herein.

CONTRACTOR agrees that a monetary remedy for breach of this Contract may be inadequate, impracticable, or difficult to prove and that a breach may cause **CITY** irreparable harm. **CITY** may therefore enforce this requirement by seeking injunctive relief and specific performance, without any necessity of showing actual damage or irreparable harm. Seeking injunctive relief or specific performance does not preclude **CITY** from seeking or obtaining any other relief to which **CITY** may be entitled.

For all Work Products delivered to **CITY** that are not originated or prepared by **CONTRACTOR** or its Subcontractors under this Contract, **CONTRACTOR** shall secure a grant, at no cost to **CITY**, for a non-exclusive perpetual license to use such Work Products for any **CITY** purposes.

CONTRACTOR shall not provide or disclose any Work Product to any third party without prior written consent of **CITY**.

Any subcontract entered into by **CONTRACTOR** relating to this Contract shall include this provision to contractually bind its Subcontractors performing work under this Contract such that **CITY'S** ownership and license rights of all Work Products are preserved and protected as intended herein.

PSC-22. Data Protection

A. **CONTRACTOR** shall protect, using the most secure means and technology that is commercially available, **CITY**-provided data or consumer-provided data acquired in the course and scope of this Contract, including but not limited to customer lists and customer credit card or consumer data, (collectively, the "City Data"). **CONTRACTOR** shall notify **CITY** in writing as soon as reasonably feasible, and in any event within twenty-four hours, of **CONTRACTOR'S** discovery or reasonable belief of any unauthorized access of City Data (a "Data Breach"), or of any incident affecting, or potentially affecting City Data related to cyber security (a "Security Incident"), including, but not limited to, denial of service attack, and system outage, instability or degradation due to computer malware or virus. **CONTRACTOR** shall begin remediation immediately. **CONTRACTOR** shall provide daily updates, or more frequently if required by **CITY**, regarding findings and actions performed by **CONTRACTOR** until the Data Breach or Security Incident has been effectively resolved to **CITY'S** satisfaction. **CONTRACTOR** shall conduct an investigation of the Data Breach or Security Incident and shall share the report of the investigation with **CITY**. At **CITY'S** sole discretion, **CITY** and its authorized agents shall have the right to lead or participate in the investigation. **CONTRACTOR** shall cooperate fully with **CITY**, its agents and law enforcement.

B. If **CITY** is subject to liability for any Data Breach or Security Incident, then **CONTRACTOR** shall fully indemnify and hold harmless **CITY** and defend against any resulting actions.

PSC-23. Insurance

During the term of this Contract and without limiting **CONTRACTOR'S** obligation to indemnify, hold harmless and defend **CITY**, **CONTRACTOR** shall provide and maintain at its own expense a program of insurance having the coverages and limits not less than the required amounts and types as determined by the Office of the City Administrative Officer of Los Angeles, Risk Management (template Form General 146 in Exhibit 1 hereto). The insurance must: (1) conform to **CITY'S** requirements; (2) comply with the Insurance Contractual Requirements (Form General 133 in Exhibit 1 hereto); and (3) otherwise be in a form acceptable to the Office of the City Administrative Officer, Risk Management. **CONTRACTOR** shall comply with all Insurance Contractual Requirements shown on Exhibit 1 hereto. Exhibit 1 is hereby incorporated by reference and made a part of this Contract.

PSC-24. Best Terms

Throughout the term of this Contract, **CONTRACTOR**, shall offer **CITY** the best terms, prices, and discounts that are offered to any of **CONTRACTOR'S** customers for similar goods and services provided under this Contract.

PSC-25. Warranty and Responsibility of Contractor

CONTRACTOR warrants that the work performed hereunder shall be completed in a manner consistent with professional standards practiced among those firms within **CONTRACTOR'S** profession, doing the same or similar work under the same or similar circumstances.

PSC-26. Mandatory Provisions Pertaining to Non-Discrimination in Employment

Unless otherwise exempt, this Contract is subject to the applicable non-discrimination, equal benefits, equal employment practices, and affirmative action program provisions in LAAC Section 10.8 et seq., as amended from time to time.

A. **CONTRACTOR** shall comply with the applicable non-discrimination and affirmative action provisions of the laws of the United States of America, the State of California, and **CITY**. In performing this Contract, **CONTRACTOR** shall not discriminate in any of its hiring or employment practices against any employee or applicant for employment because of such person's race, color, religion, national origin, ancestry, sex, sexual orientation, gender, gender identity, age, disability, domestic partner status, marital status or medical condition.

B. The requirements of Section 10.8.2.1 of the LAAC, the Equal Benefits Ordinance, and the provisions of Section 10.8.2.1(f) are incorporated and made a part of this Contract by reference.

C. The provisions of Section 10.8.3 of the LAAC are incorporated and made a part of this Contract by reference and will be known as the "Equal Employment Practices" provisions of this Contract.

D. The provisions of Section 10.8.4 of the LAAC are incorporated and made a part of this Contract by reference and will be known as the "Affirmative Action Program" provisions of this Contract.

Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-27. Child Support Assignment Orders

CONTRACTOR shall comply with the Child Support Assignment Orders Ordinance, Section 10.10 of the LAAC, as amended from time to time. Pursuant to Section 10.10(b) of the LAAC, **CONTRACTOR** shall fully comply with all applicable State and Federal employment reporting requirements. Failure of **CONTRACTOR** to comply with all applicable reporting requirements or to implement lawfully served Wage and Earnings Assignment or Notices of Assignment, or the failure of any principal owner(s) of **CONTRACTOR** to comply with any Wage and Earnings Assignment or Notices of Assignment applicable to them personally, shall constitute a default by the **CONTRACTOR** under this Contract. Failure of **CONTRACTOR** or principal owner to cure

the default within 90 days of the notice of default will subject this Contract to termination for breach. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-28. Living Wage Ordinance

CONTRACTOR shall comply with the Living Wage Ordinance, LAAC Section 10.37 *et seq.*, as amended from time to time. **CONTRACTOR** further agrees that it shall comply with federal law proscribing retaliation for union organizing. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-29. Service Contractor Worker Retention Ordinance

CONTRACTOR shall comply with the Service Contractor Worker Retention Ordinance, LAAC Section 10.36 *et seq.*, as amended from time to time. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-30. Access and Accommodations

CONTRACTOR represents and certifies that:

A. **CONTRACTOR** shall comply with the Americans with Disabilities Act, as amended, 42 U.S.C. Section 12101 et seq., the Rehabilitation Act of 1973, as amended, 29 U.S.C. Section 701 et seq., the Fair Housing Act, and its implementing regulations and any subsequent amendments, and California Government Code Section 11135;

B. **CONTRACTOR** shall not discriminate on the basis of disability or on the basis of a person's relationship to, or association with, a person who has a disability;

C. **CONTRACTOR** shall provide reasonable accommodation upon request to ensure equal access to **CITY**-funded programs, services and activities;

D. Construction will be performed in accordance with the Uniform Federal Accessibility Standards (UFAS), 24 C.F.R. Part 40; and

E. The buildings and facilities used to provide services under this Contract are in compliance with the federal and state standards for accessibility as set forth in the 2010 ADA Standards, California Title 24, Chapter 11, or other applicable federal and state law.

CONTRACTOR understands that **CITY** is relying upon these certifications and representations as a condition to funding this Contract. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-31. Contractor Responsibility Ordinance

CONTRACTOR shall comply with the Contractor Responsibility Ordinance, LAAC Section 10.40 *et seq*., as amended from time to time.

PSC-32. Business Inclusion Program

Unless otherwise exempted prior to bid submission, **CONTRACTOR** shall comply with all aspects of the Business Inclusion Program as described in the Request for Proposal/Qualification process, throughout the duration of this Contract. **CONTRACTOR** shall utilize the Business Assistance Virtual Network ("BAVN") at https://www.labavn.org/, to perform and document outreach to Minority, Women, and Other Business Enterprises. **CONTRACTOR** shall perform subcontractor outreach activities through BAVN. **CONTRACTOR** shall not change any of its designated Subcontractors or pledged specific items of work to be performed by these Subcontractors, nor shall **CONTRACTOR** reduce their level of effort, without prior written approval of **CITY**.

PSC-33. Slavery Disclosure Ordinance

CONTRACTOR shall comply with the Slavery Disclosure Ordinance, LAAC Section 10.41 *et seq.*, as amended from time to time. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-34. First Source Hiring Ordinance

CONTRACTOR shall comply with the First Source Hiring Ordinance, LAAC Section 10.44 *et seq.*, as amended from time to time. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-35. Local Business Preference Ordinance

CONTRACTOR shall comply with the Local Business Preference Ordinance, LAAC Section 10.47 *et seq.*, as amended from time to time. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-36. Iran Contracting Act

In accordance with California Public Contract Code Sections 2200-2208, all contractors entering into, or renewing contracts with **CITY** for goods and services estimated at $1,000,000 or more are required to complete, sign, and submit the "Iran Contracting Act of 2010 Compliance Affidavit."

PSC-37. Restrictions on Campaign Contributions and Fundraising in City Elections

Unless otherwise exempt, if this Contract is valued at $100,000 or more and requires approval by an elected **CITY** office, **CONTRACTOR**, **CONTRACTOR'S** principals, and **CONTRACTOR'S** Subcontractors expected to receive at least $100,000 for performance under the Contract, and the principals of those Subcontractors (the "Restricted Persons")

shall comply with Charter Section 470(c)(12) and LAMC Section 49.7.35. Failure to comply entitles **CITY** to terminate this Contract and to pursue all available legal remedies. Charter Section 470(c)(12) and LAMC Section 49.7.35 limit the ability of the Restricted Persons to make campaign contributions to and engage in fundraising for certain elected **CITY** officials or candidates for elected **CITY** office for twelve months after this Contract is signed. Additionally, a **CONTRACTOR** subject to Charter Section 470(c)(12) is required to comply with disclosure requirements by submitting a completed and signed Ethics Commission Form 55 and to amend the information in that form as specified by law. Any **CONTRACTOR** subject to Charter Section 470(c)(12) shall include the following notice in any contract with any Subcontractor expected to receive at least $100,000 for performance under this Contract:

> "Notice Regarding Restrictions on Campaign Contributions and Fundraising in City Elections
>
> You are a subcontractor on City of Los Angeles Contract # _____. Pursuant to the City of Los Angeles Charter Section 470(c)(12) and related ordinances, you and your principals are prohibited from making campaign contributions to and fundraising for certain elected City of Los Angeles ("**CITY**") officials and candidates for elected **CITY** office for twelve months after the **CITY** contract is signed. You are required to provide the names and contact information of your principals to the **CONTRACTOR** and to amend that information within ten business days if it changes during the twelve month time period. Failure to comply may result in termination of this Contract and any other available legal remedies. Information about the restrictions may be found online at ethics.lacity.org or by calling the Los Angeles City Ethics Commission at (213) 978-1960."

PSC-38. Contractors' Use of Criminal History for Consideration of Employment Applications

CONTRACTOR shall comply with the City Contractors' Use of Criminal History for Consideration of Employment Applications Ordinance, LAAC Section 10.48 *et seq*., as amended from time to time. Any subcontract entered into by **CONTRACTOR** for work to be performed under this Contract must include an identical provision.

PSC-39. Limitation of City's Obligation to Make Payment to Contractor

Notwithstanding any other provision of this Contract, including any exhibits or attachments incorporated therein, and in order for **CITY** to comply with its governing legal requirements, **CITY** shall have no obligation to make any payments to **CONTRACTOR** unless **CITY** shall have first made an appropriation of funds equal to or in excess of its obligation to make any payments as provided in this Contract. **CONTRACTOR** agrees that any services provided by **CONTRACTOR**, purchases made by **CONTRACTOR** or expenses incurred by **CONTRACTOR** in excess of the appropriation(s) shall be free and without charge to **CITY** and **CITY** shall have no obligation to pay for the services, purchases or expenses. **CONTRACTOR** shall have no obligation to provide any services,

provide any equipment or incur any expenses in excess of the appropriated amount(s) until **CITY** appropriates additional funds for this Contract.

PSC-40. Compliance with Identity Theft Laws and Payment Card Data Security Standards

CONTRACTOR shall comply with all identity theft laws including without limitation, laws related to: (1) payment devices; (2) credit and debit card fraud; and (3) the Fair and Accurate Credit Transactions Act ("FACTA"), including its requirement relating to the content of transaction receipts provided to Customers. **CONTRACTOR** also shall comply with all requirements related to maintaining compliance with Payment Card Industry Data Security Standards ("PCI DSS"). During the performance of any service to install, program or update payment devices equipped to conduct credit or debit card transactions, including PCI DSS services, **CONTRACTOR** shall verify proper truncation of receipts in compliance with FACTA.

PSC-41. Compliance with California Public Resources Code Section 5164

California Public Resources Code Section 5164 prohibits a public agency from hiring a person for employment or as a volunteer to perform services at any park, playground, or community center used for recreational purposes in a position that has supervisory or disciplinary authority over any minor, if the person has been convicted of certain crimes as referenced in the Penal Code, and articulated in California Public Resources Code Section 5164(a)(2).

If applicable, **CONTRACTOR** shall comply with California Public Resources Code Section 5164, and shall additionally adhere to all rules and regulations that have been adopted or that may be adopted by **CITY**. **CONTRACTOR** is required to have all employees, volunteers and Subcontractors (including all employees and volunteers of any Subcontractor) of **CONTRACTOR** working on premises to pass a fingerprint and background check through the California Department of Justice at **CONTRACTOR'S** sole expense, indicating that such individuals have never been convicted of certain crimes as referenced in the Penal Code and articulated in California Public Resources Code Section 5164(a)(2), if the individual will have supervisory or disciplinary authority over any minor.

PSC-42. Possessory Interests Tax

Rights granted to **CONTRACTOR** by **CITY** may create a possessory interest. **CONTRACTOR** agrees that any possessory interest created may be subject to California Revenue and Taxation Code Section 107.6 and a property tax may be levied on that possessory interest. If applicable, **CONTRACTOR** shall pay the property tax. **CONTRACTOR** acknowledges that the notice required under California Revenue and Taxation Code Section 107.6 has been provided.

PSC-43. Confidentiality

All documents, information and materials provided to **CONTRACTOR** by **CITY** or developed by **CONTRACTOR** pursuant to this Contract (collectively "Confidential Information") are confidential. **CONTRACTOR** shall not provide or disclose any Confidential Information or their contents or any information therein, either orally or in writing, to any person or entity, except as authorized by **CITY** or as required by law. **CONTRACTOR** shall immediately notify **CITY** of any attempt by a third party to obtain access to any Confidential Information. This provision will survive expiration or termination of this Contract.

PSC-44. COVID-19

Employees of Contractor and/or persons working on its behalf, including, but not limited to, subcontractors (collectively, "Contractor Personnel"), while performing services under this Agreement and prior to interacting in person with City employees, contractors, volunteers, or members of the public (collectively, "In-Person Services") must be fully vaccinated against the novel coronavirus 2019 ("COVID-19"). "Fully vaccinated" means that 14 or more days have passed since Contractor Personnel have received the final dose of a two-dose COVID-19 vaccine series (Moderna or Pfizer-BioNTech) or a single dose of a one-dose COVID-19 vaccine (Johnson & Johnson/Janssen) and all booster doses recommended by the Centers for Disease Control and Prevention. Prior to assigning Contractor Personnel to perform In-Person Services, Contractor shall obtain proof that such Contractor Personnel have been fully vaccinated. Contractor shall retain such proof for the document retention period set forth in this Agreement. Contractor shall grant medical or religious exemptions ("Exemptions") to Contractor Personnel as required by law. If Contractor wishes to assign Contractor Personnel with Exemptions to perform In-Person Services, Contractor shall require such Contractor Personnel to undergo weekly COVID-19 testing, with the full cost of testing to be borne by Contractor. If Contractor Personnel test positive, they shall not be assigned to perform In-Person Services or, to the extent they have already been performing In-Person Services, shall be immediately removed from those assignments. Furthermore, Contractor shall immediately notify City if Contractor Personnel performing In-Person Services (1) have tested positive for or have been diagnosed with COVID-19, (2) have been informed by a medical professional that they are likely to have COVID-19, or (3) meet the criteria for isolation under applicable government orders.

EXHIBIT 1

INSURANCE CONTRACTUAL REQUIREMENTS

CONTACT For additional information about compliance with City Insurance and Bond requirements, contact the Office of the City Administrative Officer, Risk Management at (213) 978-RISK (7475) or go online at www.lacity.org/cao/risk. The City approved Bond Assistance Program is available for those contractors who are unable to obtain the City-required performance bonds. A City approved insurance program may be available as a low cost alternative for contractors who are unable to obtain City-required insurance.

CONTRACTUAL REQUIREMENTS

CONTRACTOR AGREES THAT:

1. Additional Insured/Loss Payee. The CITY must be included as an Additional Insured in applicable liability policies to cover the CITY'S liability arising out of the acts or omissions of the named insured. The CITY is to be named as an Additional Named Insured and a Loss Payee As Its Interests May Appear in property insurance in which the CITY has an interest, e.g., as a lien holder.

2. Notice of Cancellation. All required insurance will be maintained in full force for the duration of its business with the CITY. By ordinance, all required insurance must provide at least thirty (30) days' prior written notice (ten (10) days for non-payment of premium) directly to the CITY if your insurance company elects to cancel or materially reduce coverage or limits prior to the policy expiration date, for any reason except impairment of an aggregate limit due to prior claims.

3. Primary Coverage. CONTRACTOR will provide coverage that is primary with respect to any insurance or self-insurance of the CITY. The CITY'S program shall be excess of this insurance and non-contributing.

4. Modification of Coverage. The CITY reserves the right at any time during the term of this Contract to change the amounts and types of insurance required hereunder by giving CONTRACTOR ninety (90) days' advance written notice of such change. If such change should result in substantial additional cost to CONTRACTOR, the CITY agrees to negotiate additional compensation proportional to the increased benefit to the CITY.

5. Failure to Procure Insurance. All required insurance must be submitted and approved by the Office of the City Administrative Officer, Risk Management prior to the inception of any operations by CONTRACTOR.

CONTRACTOR'S failure to procure or maintain required insurance or a self-insurance program during the entire term of this Contract shall constitute a material breach of this Contract under which the CITY may immediately suspend or terminate this Contract or, at its discretion, procure or renew such insurance to protect the CITY'S interests and pay any and all premiums in connection therewith and recover all monies so paid from CONTRACTOR.

6. Workers' Compensation. By signing this Contract, CONTRACTOR hereby certifies that it is aware of the provisions of Section 3700 *et seq*., of the California Labor Code which require every employer to be insured against liability for Workers' Compensation or to undertake

self-insurance in accordance with the provisions of that Code, and that it will comply with such provisions at all time during the performance of the work pursuant to this Contract.

7. California Licensee. All insurance must be provided by an insurer admitted to do business in California or written through a California-licensed surplus lines broker or through an insurer otherwise acceptable to the CITY. Non-admitted coverage must contain a **Service of Suit** clause in which the underwriters agree to submit as necessary to the jurisdiction of a California court in the event of a coverage dispute. Service of process for this purpose must be allowed upon an agent in California designated by the insurer or upon the California Insurance Commissioner.

8. Aggregate Limits/Impairment. If any of the required insurance coverages contain annual aggregate limits, CONTRACTOR must give the CITY written notice of any pending claim or lawsuit which will materially diminish the aggregate within thirty (30) days of knowledge of same. You must take appropriate steps to restore the impaired aggregates or provide replacement insurance protection within thirty (30) days of knowledge of same. The CITY has the option to specify the minimum acceptable aggregate limit for each line of coverage required. No substantial reductions in scope of coverage which may affect the CITY'S protection are allowed without the CITY'S prior written consent.

9. Commencement of Work. For purposes of insurance coverage only, this Contract will be deemed to have been executed immediately upon any party hereto taking any steps that can be considered to be in furtherance of or towards performance of this Contract. The requirements in this Section supersede all other sections and provisions of this Contract, including, but not limited to, PSC-3, to the extent that any other section or provision conflicts with or impairs the provisions of this Section.

Form Gen. 146 (Rev. 9/06)

Required Insurance and Minimum Limits

Name: Motorola Solutions, Inc. Date: 09/30/2021

Agreement/Reference: LAFD Voice Radio System Upgrade

Evidence of coverages checked below, with the specified minimum limits, must be submitted and approved prior to occupancy/start of operations. Amounts shown are Combined Single Limits ("CSLs"). For Automobile Liability, split limits may be substituted for a CSL if the total per occurrence equals or exceeds the CSL amount.

Limits

✔ **Workers' Compensation - Workers' Compensation (WC) and Employer's Liability (EL)**

WC *Statutory*

EL **$1,000,000**

☐ Waiver of Subrogation in favor of City ☐ Longshore & Harbor Workers ☐ Jones Act

✔ **General Liability** **$1,000,000**

☑ Products/Completed Operations ☐ Sexual Misconduct

☐ Fire Legal Liability

☐

✔ **Automobile Liability** (for any and all vehicles used for this contract, other than commuting to/from work) **$1,000,000**

✔ **Professional Liability** (Errors and Omissions) **$1,000,000**

Discovery Period 12 Months After Completion of Work or Date of Termination

___ **Property Insurance** (to cover replacement cost of building - as determined by insurance company)

☐ All Risk Coverage ☐ Boiler and Machinery

☐ Flood ☐ Builder's Risk

☐ Earthquake ☐

___ **Pollution Liability**

☐

___ **Surety Bonds -** Performance and Payment (Labor and Materials) Bonds 100% of the contract price

___ **Crime Insurance**

Other:

APPENDIX B

SCOPING STATEMENT OF WORK

LAFD Voice Radio System Upgrade
Appendix B – Scoping Statement of Work

Section 1. GENERAL

1.1. Project Objectives

The objective of this project is to replace the LAFD Voice Radio System infrastructure and consoles with a new, fully integrated, and easy-to-use system that can support the Department's full range of operational needs.

1.2. In Scope Services

The Contractor shall perform all required services in order to provide the hardware and software necessary to meet the requirements described in this Appendix B Statement of Work and Appendix C Operational Requirements.

The project scope includes the following systems:

- Voice Radio System Infrastructure including, but not limited to, radio site equipment such as voters, repeaters and antennas;
- Voice Radio System Dispatch consoles at both the LAFD primary dispatch center, Metro Fire Communications (MFC) and the LAFD back-up dispatch center, Operations Command Division (OCD), including the short- and long-term logging recorders.

The project scope also includes, but is not limited to, the following professional services, described in the sections below:

- Project Management
- System Design and Configuration
- System Installation and Testing
- System Training
- System Implementation and Cutover Support
- System Warranty, Maintenance, and Support

1.3. Project Management

The Contractor shall provide a dedicated project manager who will act as the Contractor's single point of contact for all communications related to the day-to-day delivery of services. The Contractor's project manager will be available to work on site as needed for key project tasks and meetings.

The Contractor shall establish and follow a project management process that includes all necessary tools, methods and documents required to manage a project of this size, scope and duration. At a minimum, the Contractor shall provide the City:

- An initial project plan within 30 days of the project start that describes the major project tasks, durations, milestones and dependencies, similar to the sample provided in Section 12 “Implementation Schedule” of Contractor’s Proposal;
- A detailed project plan within 30 days of the final system design document that describes the specific project tasks, durations, milestones and dependencies;
- A monthly project status report that provides information about: the current state of the project; tasks accomplished since the last reporting period; tasks planned for the next reporting period; project risks and mitigations; and any items that require attention or escalation by the City.

The City shall provide a dedicated project manager who will act as the City’s single point of contact for all communications related to the day-to-day delivery of services.

1.4. Project Reporting and Escalation

The Contractor will provide the City with regular reports of project status including schedule, scope, and project risks no less than once per month and more frequently as needed. The Contractor shall escalate any issues or concerns that are not being resolved and may impact the success of the project, including the schedule, cost, or risk of completion in writing to the City’s project manager or other executive representative as appropriate.

1.5. Work Hours

The Contractor shall perform project work during normal business hours, which are Monday through Friday from 0700 – 1500. From time to time, due to operational necessity or other considerations, the Contractor may be required to perform work after-hours if performing the work during normal business hours would negatively impact the operation of the department or City. Any after-hours work shall be agreed to in advance by both the Contractor and the City.

1.6. Compliance, Construction Licensing, and Permitting

All new installations shall comply with applicable local, state, and federal laws including, but not limited to, Motorola R56, Cal OSHA, NEC, NFPA, City of LA Building Codes and Regulations, FCC, FAA, and UL. The City shall be responsible for identifying, obtaining, and managing all necessary licenses and permits. Rectification of Site issue preventing compliance with any of the applicable Standards or Regulations will be the responsibility of the City. Contractor shall provide relevant system design information and documents to assist the city in obtaining any necessary licenses and permits.

1.7. Site Access

City shall provide Contractor with access to any required sites where City equipment is located, which will include, but may not be limited to, both City-owned and leased property. City shall ensure that sufficient space is available at the site for Contractor personnel and vehicles. Some site access may be limited due to seasonal road deterioration and may require additional time and/or

coordination between City, Contractor and the site agent (if City is not the site agent). Access to 100 Wilshire will have to be coordinated with building owner/management.

The Contractor shall not perform work at any City managed facility or on City equipment unless accompanied by a City employee or designee, unless prior approval has been provided by the City to the Contractor for unaccompanied access. Project delays beyond 30 days due to site access issues will result in a Change Order.

Contractor shall abide by the requirements of the physical access security plan devised by City and any supplemental physical access security requirements promulgated by the Los Angeles Police Department, as applicable.

Section 2. SYSTEM DESIGN

2.1. System Requirements

Contractor shall provide a System that (i) contains no less than the functionality described in the post-contract detailed design documents; (ii) meets or exceed all of the requirements as described in Appendix C, High-Level Specifications; and (iii) meets or exceeds all the requirements articulated in Appendix D, Contractor's Proposal.

2.2. System Design

Contractor shall begin drafting a Detailed System Design Document for the System after Contract Execution, and such Detailed System Design Document must be materially consistent with the requirements of the Agreement, including this Appendix B Statement of Work, Appendix C High-Level Specifications, and Appendix D Contractor's Proposal.
The Contractor shall provide the City with a Detailed System Design Document that, at a minimum, contains the following:

- Detailed description of overall operational objectives and requirements
- Identification of major operational discrepancies between Appendix B / Appendix C and the post-contract detailed design plan.
- Detailed equipment layout plans and system design drawings for each site
- Detailed list of parts and materials
- Detailed list of spares provided by Contractor to the City
- High Level list of operating system versions and major hardware elements.
- Detailed system configuration specifications
- Detailed description of system security and protection against viruses and malware
- Detailed description of system high-availability and fail-over design
- Detailed description of Vendor provided API connections.
- Detailed specifications for backhaul performance and demarcations for each site
- Detailed specifications for network access and demarcations for each site
- Detailed heat and power load requirements for each site
- Detailed results of tower load study
- Detailed RF Distribution System parameters.

- Detailed intermodulation studies for frequencies provided in design
- Detailed description of interconnection of LAFD System with LAPD Voice Radio Switching System
- Preliminary system installation, test, and cutover plans
- Detailed single-channel proof of performance installation and testing plan
- Provide informational only 12.5KHz coverage maps

Prior to any equipment delivery or installation, the City must provide the Contractor with written acceptance of the Detailed System Design Document pursuant to Section 2.3, below.

2.3. Detailed System Design Document Acceptance

The preliminary system design will be based upon the functional design descriptions detailed in Appendix C (*High Level Specifications*) and Appendix D (*Contractor's Proposal*). Documentation submitted shall be in sufficient detail to allow City engineers to determine the feasibility and reliability of the complete system design. The Detailed System Design Document shall include block and schematic diagrams and detailed drawings that illustrate cabling, wiring, rack layouts and elevations, equipment lists, and plans necessary for system installation and testing. The Detailed System Design Document shall be based on the approved preliminary system design detailed in Appendix D and the requirements listed in Section 2.2 above, and submitted to the City for approval prior to the commencement of any further work. The City will review and provide a written notice of approval or disapproval of the Detailed System Design Document within 30 days of receipt.

Section 3. Site Preparation and Development

The City shall provide adequate space, tower loading, or other civil requirements as defined in the Motorola-provided specifications and requirements documents. The Contractor will be responsible for developing an installation plan that minimizes impact on the existing sites. This may include, removing and replacing existing infrastructure, such as antennas, with new infrastructure that are of the same or lesser weight, stress, and power consumption, where possible.

The City shall resolve any agreed upon environmental or hazardous material issues at each site including, but not limited to any asbestos, structural integrity, or other building issues, prior to Contractor starting work at that site.

3.1. Interconnections, Networking, and Backhaul

The Contractor shall provide the City with detailed specifications for all required interconnections, networking, and backhaul. The City will provide the Contractor with access to all required interconnections, network, and backhaul infrastructure as identified in the Detailed System Design Document. This includes, but is not be limited to, Ethernet network connectivity at all voter, remote, and dispatch site locations.

The System will use existing City-provided microwave network and Cisco MPLS routers in conjunction with Contractor-provided IP-network/MPLS configuration to be implemented as backhaul to and between each of the sites, as well as dispatch centers.

Contractor shall provide all equipment, cabling, and materials needed to connect the system to the City's demarcation point.

Section 4. SYSTEM INSTALLATION

4.1. System Staging

Initial system configuration and staging will take place at Contractor's facilities. Contractor shall assemble, stage, and configure all equipment as it will be installed at each site, including, but not limited to, racking, cable runs, connections, labeling, software installation and configuration, and document the system inventory, including detailed list of equipment items and serial numbers.

Contractor shall provide travel and accommodations for up to twelve (12) City employees and/or representatives to travel to Contractor facility to witness the performance of the Factory Functional Acceptance tests.

Contractor shall perform continuous (24 hours per day) system "burn-in" during staging to isolate and capture any defects.

4.2. System Shipping and Warehousing

The Contractor shall pack and ship all equipment to a local delivery point that is maintained by the Contractor for receipt, inventory, and storage of equipment prior to the delivery to any specific site for installation. Contractor shall use this local warehouse as a central distribution location for all remote site installations. Contractor will store the equipment, as necessary, prior to installation for the duration identified in the Project Schedule. Equipment will not be delivered directly to a specific site for storage until it is ready for installation. The City and Contractor will jointly receive and perform a detailed inventory of all equipment delivered to the Contractor's receiving facility.

4.3. Site Readiness

The City shall ensure that each site is ready for equipment prior to the Contractor starting installation, unless otherwise mutually agreed to by both the City and the Contractor. In accordance with the agreed upon project schedule, City shall provide the Contractor with notice when the site is ready for installation work to begin. Contractor shall not be obligated to begin performing work on any site until 15 days, or unless mutually agreed upon, following City having provided notice to Contractor that the site is ready.

4.4. Tower Load Study

For each of the nine (9) radio tower sites, the Contractor shall perform a tower loading study, according to mutually agreed criteria, at the radio tower site to ensure that no loading issues exist

with the replacement of the existing equipment with the new equipment. Contractor shall perform the tower loading study for a particular site prior to the installation of any equipment at that site.

4.5. Intermodulation Study

Prior to the start of equipment installation at each of the nine (9) radio tower sites, Contractor shall perform an intermodulation (IM) study to find the effects of other radio interference resulting from all other frequencies in use at each site. The City will provide the Vendor with a list of frequencies present at each site location. The purpose of the analysis is to determine the baseline radio frequency (RF) environment at each site to minimize or eliminate intermodulation issues.

The intermodulation study shall analyze intermodulation interference, transmitter noise interference, and receiver desensitization. Contractor shall submit a report on the results of the intermodulation study that will serve as a guide for channel assignments, transmitter combining, and site selection. The report shall specify potential sources of interference and the preventive measures that will be taken to address any identified interference problems. Contractor will assist the City to identify interference or desensitization issues, but because the Contractor must use specified Frequencies, resolution of interference or desensitization issues is the responsibility of the City.

4.6. System Installation

Contractor shall perform all required installation and configuration of Contractor provided equipment as specified in the Detailed System Design. This includes, but is not limited to, all required installation at each of the various locations, such as radio sites and dispatch centers.

4.7. Phased Implementation

Contractor shall perform a phased implementation that minimizes operational disruption and/or downtime and allows for the continuous operation of the current LAFD voice radio system while the new system is being installed.

Contractor shall first install and configure one (1) channel at each of the nine (9) sites as a “proof of performance” for a minimum of thirty (30) days in operation prior to the installation and operation of the remaining channels.

Contractor shall first install and configure all dispatch consoles located at the Operations Control Division (OCD) back-up dispatch center located at City Hall East P4 as a “proof of performance” for a minimum of thirty (30) days in operation prior to the installation and operation of the remaining consoles at Metro Fire Communications (MFC) dispatch center.

Contractor shall ensure that during the phased implementation there is no interruption or other disruption to the audio recording of the existing telephone or radio systems as the new system is being installed.

The City must accept the "proof-of-performance" test before proceeding with the rest of the installation.

4.8. Implementation Schedule

Contractor shall provide the City with a detailed implementation plan and schedule that, at a minimum, describes the specific order of required tasks, timeline, and dependencies of all planned installations. System implementation and cutover shall not start until the City has approved the Contractor's system implementation plan.

4.9. Channel Cutover

Contractor shall provide the City with a detailed cutover plan that identifies how and when each channel will be cutover from the old to the new system and identify any potential operational impacts. Contractor shall delineate a cutover plan that provides a seamless transition from the old to the new system. The channel cutover plan shall also identify how each channel will be tested and/or verified at cutover prior to moving on to the next channel. The contractor will design the cut-over plan to feature minimal operational impact.

Current system capabilities that must be supported during cutover include, but are not limited to:

- VHF/UHF radio system
- 800 MHz analog simulcast radio system
- Current 800 MHz Mutual Aid Repeater System
- Current LAFD Air to Ground Channel and VHF Mutual Aid radio system
- Conventional FM two-way radio base and or repeater stations
- Current Voice Radio System
- Variety of networking technologies and topologies.

The Voice Radio Switch at CHE P4 OCD will be replaced, tested, and accepted before the Voice Radio Switch is replaced at MFC.

4.10. Current Version

Contractor shall ensure that all hardware, software, and firmware is operating at the most current and fully supported version at the time of staging system acceptance testing.

4.11. Rack Elevation Drawings

Contractor shall provide illustrations of any equipment to be mounted in racks in rack elevation drawings with equipment model and serial numbers clearly labeled for each piece of equipment.

Updated, as-built drawings will be included as part of the system documentation described in Section 7.

4.12. Equipment Removal

Contractor shall transport all removed equipment to a location designated by the City that is within the City limits. Removed equipment is limited to old DC system, voters, transmitters, receivers, antennas, line, dispatch consoles, and other related legacy radio systems and related equipment and materials.

Section 5. SYSTEM OPTIMIZATION AND TESTING

5.1. System Test Plan

The Contractor shall perform all tests necessary to demonstrate that the VRSU system fully and completely meets all specified requirements, as detailed in Appendix C. The Contractor shall provide all necessary personnel, labor, materials, documentation, and test equipment to perform all acceptance tests. City personnel and/or their representative will attend and monitor Factory Staging and Field Acceptance Tests. Contractor shall pay for Factory Staging, Testing, and Field Acceptance, and accommodate a total of twelve (12) City personnel: six (6) City personnel for Voice Radio Switch and six (6) for Voice Radio System.

The test plan and procedures shall be designed to ensure that the equipment and software meet system reliability, maintainability, maximum system capacity, maximum system load, alarms, and diagnostics requirements. Tests shall also include redundancy of the systems for automatic switchover from primary to backup. This also includes system, subsystem specification, verifications, signal level adjustments and optimization.

Formal sign-off and acceptance by the City is required at each stage of testing.

Prior to the start of system testing, Contractor shall provide the City with a comprehensive overall System Test Plan. The System Test Plan shall describe, in detail, each of the various system tests that will be performed during the project.

At a minimum, each System Test Plan must include: the test objectives; how the test will be performed; who will be performing the test; the observable pass/fail criteria; and who will be observing/signing off on the test.

Contractor shall provide a detailed test plan for each of the major project milestones, including, but not limited to the following:

- **Factory Acceptance Test Plan (FATP):** Contractor shall design a plan to stage and test the system equipment at the factory prior to shipment, as witnessed by City staff. Contractor shall perform factory functional acceptance tests of system features, conduct site and system level testing, and perform system burn-in 24 hours a day during staging to isolate and capture any defects.
- **Proof of Performance Test Plan (PoPTP):** Contractor shall design a plan for an initial test of the system that shall serve as a “proof of performance.” Contractor shall install the consoles at OCD and one channel at each of the nine (9) remote sites to test the system

functions and operations as a Proof of Performance (PoP) before implementing the rest of the system. PoP testing shall be performed against the requirements in Appendix C and the agreed-upon design in Appendix D. City personnel must be present at the testing and give final approval before the Contractor proceeds with the rest of the system installation.

- **Coverage Acceptance Test Plan (CATP):** Contractor shall devise a plan to test the radio coverage in accordance with TIA TSB-88 standards within the Service Area of the City of Los Angeles. The Service Area shall be broken into 1-mile-x-1-mile grids, and all grids shall be tested. Upon finalization of RF Distribution System Design in the Project Design Review process a formal CATP with Service Area Coverage guarantees will be generated.

- **Field Acceptance Test Plan (ATP):**
    - **IP Acceptance Test Plan:** As part of the IP test plan, the Contractor shall test the efficacy of the IP system, including MPLS.
    - **Voter Acceptance Test Plan:** Contractor shall devise a plan to test that voters choose the best signal from a portable or mobile radio for the dispatcher's received audio and for retransmission to other mobiles and portables.
    - **Dispatch Console Acceptance Test Plan:** Contractor shall perform all tests necessary to demonstrate that the dispatch console fully and completely meets all features and functions as described in the approved Detailed System Design Document.
    - **Logging Recorder Acceptance Test Plan:** Contractor shall provide a logging recorder test plan for both the Long-Term and Short-Term Recorders that meets the requirements as described in the Detailed System Design Document, including but not limited to the features, system redundancy, and integration with Master Time Base, 9-1-1, Phone, DCN, and Radio communication systems. Audio and video recording of Telemedicine should also be included in the test plan.

5.2. 30-Day Reliability/Operational Tests

Contractor shall perform a 30-Day Operational Test to ensure that all hardware and software defects have been corrected prior to entering final system acceptance. The fully integrated operation of the system shall be demonstrated during this test. The test shall be designed to demonstrate the reliability, long-term stability, and maintainability of the system.

Any major failure, equipment down-time, or performance degradation that requires adjustment or modification of the system during the 30-day test period shall require that the test be terminated, corrective action taken, and the entire 30-day test re-initiated.

5.3. Re-testing

Acceptance tests that fail to meet the acceptance criteria may be re-scheduled and re-initiated at a mutually agreed schedule. Additional acceptance tests required to demonstrate compliance may be initiated only upon express written permission from the City.

5.4. Final System Acceptance

Contractor shall demonstrate to the City's satisfaction that the equipment complies with the features and functionality agreed upon in the final post-contract detailed design documentation. Final system acceptance requires, but is not limited to, the following:

- Completion of all system component, hardware, and software delivery, installation, training, testing, integration, phase-over, as-built documentation, and contract deliverables.
- Written certification by Contractor of compliance with the performance requirements.
- Successful completion of a 30-day operational test. Critical and Major failures, as defined in Appendix D, Section 13 "Functional Acceptance Test Plan" will result in repeating the 30-day test.
- Correction of all punch-list items found during the acceptance test plans and 30-day operational test.
- City sign-off on the above.

5.5. Integration Testing

Contractor to provide API Tech Support to integrate and test with the following: Radio System, Voter/Comparator, ACD, Fire Station Alerting System (FSAS-DCN), CAD system, Master Time Base (MTB), SONET system, Logging Recorders, and other systems.

Contractor shall provide the necessary technical support to ensure that their equipment/subsystem provides the performance, functions, and interfaces to other equipment necessary to meet this prime objective.

Section 6. TRAINING

6.1. Technical Training

Contractor shall provide the City with all required technical training and documentation, including a video recording of the training, necessary for the City to effectively operate the system and fulfill the City's support and maintenance responsibilities. Contractor shall provide the City with a detailed Training Plan that includes, but is not limited to:

- A list and description of all required Technical training courses and prerequisites;
- A training schedule, including the order, number, and duration of courses;
- A description of training logistics, including required space and equipment needed.

The Contractor shall provide all required in-person technical training at City facilities for up to twelve (12) City technicians and engineers.

City technicians will receive "on-the-job" training during the first year of warranty.

6.2. End User Training

The Contractor shall provide the City with all required operational, "end-user" training and documentation, including a video recording of the training, necessary for the City to effectively operate the system. The Contractor shall provide the City with a detailed Training Plan that includes, but may not be limited to:

- List and description of all required Operational training courses and prerequisites;
- Training schedule, including the order, number and duration of courses
- Training logistics, including required space, and equipment needed

The Contractor shall provide all required in-person operational training in a 'train-the-trainer' format for up to fifteen (15) City end-user trainers and engineers.

The City will be responsible for completing the remaining end-user training after the Contractor has provided end-user training and prior to system go-live.

Section 7. DOCUMENTATION

7.1. Documentation

Contractor shall provide all necessary as-built Documentation prior to Final System Acceptance. Documentation includes, but is not limited to, Contractor's training course materials, system specifications, hardware requirements, technical service manuals, software configuration files, cutover documentation, site block diagrams, site floor plans, site equipment rack configurations, antenna network drawings for RF sites, ATP test checklists, functional Acceptance Test Plan test sheets and results, equipment inventory list, console programming template, maintenance manuals and all other user instructions regarding the capabilities, operation, installation, and use of the System, including all online help files and other user instructions. Any modification to the Documentation will not reflect an overall material decrease in the functionality or performance of the System from that existing on the date of Final System Acceptance.

The Contractor shall provide all documentation, firmware, software in a digital media format in the case it is required for system recovery.

Section 8. SYSTEM WARRANTY, MAINTENANCE, AND SUPPORT

8.1. System Warranty and Extended Maintenance and Support

The Contractor shall provide one (1) year of standard warranty and, at City's option, five (5) years of extended maintenance and support to ensure the continuous operation of the System according to City's requirements. The Contractor's warranty and maintenance service must cover both ongoing planned preventative maintenance and support as well as rapid response to any unforeseen issues in order to minimize downtime and disruption of service. The warranty period will begin upon Final System Acceptance, and will continue for one year. Immediately upon completion of the warranty period, the maintenance and support period will begin. The Contractor shall provide

sample Warranty and Maintenance SOW's as part of Appendix D, Contractor Proposal. Warranty and Maintenance SOW's will be finalized during the post-contract design period.

8.2. Centralized Service Delivery

The Contractor shall provide the City with a single point-of-contact for all support issues, including any communications between the City, third-party subcontractors and manufacturers, and the Contractor.

The Contractor shall provide the City with a method of documenting and tracking the status of all support requests and will provide the City with accurate and timely reports of all service performance including the nature, impact, duration and disposition. The Contractor shall provide the City with a means of escalating service requests as needed.

The Contractor shall answer critical "Priority 1" service calls, as defined in Appendix D, Section 16 "ASTRO® 25 Services Statement of Work", in no more than 30 minutes and non-critical calls within one hour, 24 hours per day, seven (7) days per week and provide a means of escalation when the City determines an issue is not being resolved or addressed in a timely or satisfactory manner.

8.3. Field Service Delivery

The Contractor shall provide on-site repair 24 hours per day, seven (7) days per week. The Contractor shall use only authorized, trained and qualified local field service delivery personnel responsible for complete end-to-end support, which includes but may not be limited to, diagnosis, repair, replacement and preventive maintenance.

The Contractor shall maintain a sufficient supply of available spare parts on-hand and field service personnel staffing levels to minimize service disruption and/or degradation to no more than four (4) hours. At a minimum, the Contractor shall maintain spares at agreed upon locations numbering 10% of the total for each critical part (as per the City's Project Manager), no less than one (1), for each critical system part.

The Contractor shall supply a comprehensive list of spares and its subsystems. All spare parts shall be properly packed and protected, marked, tagged as appropriate, and accompanied by documentation. All spares shall be up-to-date with the hardware, software, and firmware during the maintenance periods of the entire system.

8.4. Preventive Maintenance

Preventative Maintenance shall be provided on an 8x5 schedule. Once the first year of warranty expires, the City shall perform pro-active, preventive maintenance on a regular schedule of all systems including hardware, firmware, software, and all site equipment/devices, as recommended by the Contractor.

8.5. Network Hardware Repair

The Contractor shall manage all logistics of equipment repair (including providing Return Material Authorization (RMA) and the return of repaired equipment), repair or replace equipment, and coordinate the repair of third-party solution components. Contractor shall exchange any malfunctioning components and equipment with advanced replacement units and ensure that all critical system components are available locally.

8.6. Maintain Current Versions

The Contractor shall ensure that all installed Hardware, Software, and Firmware is supported by the Contractor and either repairable, or replaceable in the event of a failure.

Section 9. PRICING

9.1. System Price

The Contractor shall provide the Voice Radio System solution for a firm fixed price of $17,953,555.68, which pricing has been calculated as follows:

Component	Price
Voter & Transmitter Equipment:	$9,066,153.30
Dispatch Console Equipment	$8,416,705.64
Contract Equipment Discount	$(2,248,277.63)
Implementation Services	$5,931,671.19
System Sub-Total	$21,166,252.50
Volume Purchase Discount	$(1,750,503.20)
June 30th 2022 PO Discount	$(1,531,690.30)
Quantar Trade-In Discount	$(1,377,788.55)
System Total	$16,506,270.45
Estimated Taxes (9.5% on Equipment)	$1,447,285.22
System Total + Tax	$17,953,555.68

9.2. Payment Schedule

Payments will be made according the Payment Milestone Schedule, in this Section 9.2.

Payment Milestone	% of System Total	Invoice Amount (Excl. Tax)	Milestone
1	5%	$825,313.52	Contract execution or issuance of a Purchase Order
2	8%	$1,320,501.64	Design Review Acceptance
3	10%	$1,650,627.05	Shipment of equipment to City
4	15%	$2,475,940.57	Installation of First Channel
5	16%	$2,641,003.27	Installation of Dispatch Console & Logging Recorder Sub-System
6	15%	$2,475,940.57	Completion of Coverage Testing
7	16%	$2,641,003.27	Installation of remaining Channels
8	15%	$2,475,940.57	Final System Acceptance

9.3. Optional Extended Maintenance Pricing

Should City, at City's sole discretion, elect to purchase extended maintenance from Contractor, City's payments to Contractor shall occur in accordance with the following schedule and at the following prices. For each year that City elects to obtain maintenance services from Contractor, Contractor shall provide the extended maintenance services contemplated by this Agreement, for a price not to exceed the corresponding price articulated below.

Year	Price
Year 1	Warranty (no cost)
Year 2	$2,159,302
Year 3	$2,203,005
Year 4	$2,248,019
Year 5	$2,294,364
Year 6	$2,342,132

APPENDIX C

HIGH-LEVEL SPECIFICATIONS

LAFD Voice Radio System Upgrade

Appendix C – High-Level Specifications

Section 1. General

1.1. Objective

The objective of this project is to update the LAFD's aging radio system with modern, fully supported hardware and software while maintaining capabilities and performance in accordance with the Project specifications and design documentation.

1.2. System Uptime

The Contractor shall ensure that the components included in this project operate 99.99% of the time, measured twenty-four (24) hours per day, seven (7) days per week, 365 days per year. The Contractor shall ensure that the system is not susceptible to systemwide outage and/or degraded performance, greater than a single channel or single dispatch console, due to the failure of a single component or subsystem.

Section 2. Analog Voice Radio System Infrastructure Upgrade

2.1. General

The Contractor shall upgrade the current LAFD 800MHz analog voice radio system infrastructure at each of the nine (9) radio tower sites and at City Hall East, and Metro Fire Communications sites with a new, modern, and fully supported 800MHz voice radio system with Internet Protocol (IP) infrastructure without degradation of system coverage or performance.

TABLE 1 – LAFD RADIO TRANSMITTER SITES		
Number	**Site Name**	**Site Address**
1	100 Wilshire	100 Wilshire Blvd, Santa Monica, 90401
2	Baldwin Hills	4201 S La Brea Ave., Los Angeles, 90008
3	Beverly Glenn	14240 Mulholland Dr., Beverly Hills, 90077
4	Los Angeles City Hall	200 N. Spring St., Los Angeles, 90012
5	KSKQ Radio	4600 Carter Dr., Los Angeles, 90032
6	Mount Washington	721 Lark Court, Los Angeles, 90065
7	Oat Mountain	Oat Mountainway, Porter Ranch, 91326
8	San Pedro Hill	3960 Crest Rd, Rancho Palos Verdes, 90275
9	Verdugo Peak	Verdugo Mountainway, Glendale, 91214

2.2. Conventional two-way radio base and repeater stations

The Contractor shall support conventional FM two-way radio base and/or repeater stations.

2.3. Channel Capacity

The Contractor shall install and configure twenty (20) non-trunked 800 MHz radio channels in a simulcast repeated voice at each of the nine (9) RF remote site locations.

2.4. Conventional Comparators and Voters

The Contractor shall replace existing eighteen (18) voter/comparators with twenty (20) voter/comparators and existing 180 remote site transmitters with new equipment to receive audio from multiple sites and identify and combine the highest quality audio for transmission.

The Contractor shall install the new voter/comparators at Metro Fire Communications (MFC) and remove the existing voter/comparators from Operations Control Dispatch (OCD).

2.5. Radio Frequency Distribution Subsystems

The Contractor shall replace all radio frequency (RF) distribution subsystems at each of the nine (9) sites including, but not limited to, any required 800MHz combiners, couplers, transmission lines, lightning arrestors, tower-top amplifiers, and antennas.

2.6. GPS Frequency and Time Reference

The Contractor shall provide GPS-based frequency and time reference at all repeater sites and circuit-based or IP-based voting subsystems.

2.7. Serviceability

The Contractor shall provide configurable and upgradeable software and convertible hardware to ensure maximum hardware lifespan.

The Contractor shall provide “software-only” installation of upgrades, patching, and new releases.

The Contractor shall provide front access for hot-swappable components.

2.8. Power Backup

The Contractor shall provide AC/DC-48V power supply at each site with integrated battery revert and charging to limit dependency on site UPS in the event of a power failure.

The Contractor shall provide DC systems for 8-hour, off-power runtime, and 12-hour recharge at each site.

2.9. Voice Quality

The Contractor shall meet or exceed the LAFD’s standards for audio quality.

2.10. Coverage

The Contractor shall provide proposed 12.5kHz coverage maps for comparison of current system coverage, the baseline, with new (proposed) system coverage, the required coverage of the new system, for comparison at time of design, prior to system installation.

The Contractor shall provide full-size coverage maps for both 25kHz and informational-only 12.5kHz in PDF format and on Size-E plot during the post-contract-award design review. All the properties of antenna height and detail specs needed will be submitted to City as part of delivery packages at the same time.

The Contractor shall complete a DAQ-3.0 baseline coverage test of the existing radio system and design the new system to meet or exceed the composite coverage of the

existing system.

2.11. Emergency Trigger

The Contractor shall provide Emergency Trigger function of the radios for the operation of the dispatchers and radio users in the field.

The Contractor shall display the field unit ID at the dispatch terminal, console, or both, and activate an audible alert when a field unit activates the emergency function of the radio unit.

2.12. Inbound (Uplink) Operation

The Contractor shall design the system so that when the portable or mobile radio is keyed up, the signal is received by one or more repeater receivers on that channel.

The Contractor shall design tower-top receiver preamplifiers at all repeater sites to provide balanced uplink/downlink system gains to eliminate the need for additional voting receiver sites.

The Contractor shall design the audio from each repeater receiver (Unit ID and voice) to be sent via the City's digital microwave system to the simulcast central equipment.

2.13. Outbound (Downlink) Operation

The Contractor shall design console transmit and push-to-talk (PTT) audio to meet LAFD's operational and functional requirements defined in this Appendix. Prioritize the console operator over inbound radio traffic on the channel. All voice radio channels shall be capable of operating in analog simplex mode from the console.

2.14. Automatic Telephone Interconnect Operation

The Contractor shall provide a radio telephone interconnect phone patch on each of the 20 channels in the simulcast radio system to give access to telephone lines via the radio system. These lines can be shared by another extension or can be dedicated to the radio telephone interconnect.

2.15. Station ID Announcer

The Contractor shall provide automatic station ID announcer units for station identification on the twenty (20) LAFD radio channels. The station call sign shall be transmitted by Morse Code or other means at intervals as required by the Federal Communications Commission (FCC). Any transmission from the operator consoles shall override the announcer.

2.16. Redundancy

The Contractor shall design all critical components with redundancy in order to provide high system availability.

2.17. Equipment and Hardware Requirements

The Contractor shall provide critical components with hot standbys that will automatically come online in the event of a failure in the primary unit and design the system to revert to primary once issues are resolved.

The Contractor shall provide equipment that will function in all remote RF sites, OCD, and MFC under extreme operating conditions.

2.18. Software Requirements

The Contractor shall ensure that all hardware is capable of accepting the latest software at the time of staging acceptance.

The Contractor shall use software that allows encryption algorithms to be added or upgraded in existing secure-capable sites.

The Contractor shall provide a list of all software installed in all systems equipment, a brief description of their function(s), and the latest configuration file (soft copy) for the radio system that will be used in the event of any failures.

Section 3. Dispatch Console System

3.1. General

The Contractor shall replace seventy-two (72) voice radio dispatch consoles located at Metro Fire Communications Center (MFC) and twenty-eight (28) located at the LAFD back-up center, Operations Command Center (OCD), located on P4 at City Hall East and associated equipment that supports the consoles.

3.2. Integrated Dispatch Environment

The Contractor shall provide an integrated dispatch environment for LAFD user operators, functioning together with Fire Station Alerting System-Dispatch Communications Network (FSAS-DCN), LAFD Computer Aided Dispatch (CAD) system, Logging Recorders, Master Time Base (MTB), and Transmission System, which support the activities of the LAFD 9-1-1 dispatch operation.

While the City and its various vendors are responsible for writing and testing 3rd party interfaces, the Contractor must provide API access, documentation, and at least 40 hours

of API technical support. Additional API technical support should be optionally priced.

3.3. Redundancy

The Contractor shall provide redundancy for both Primary Dispatch Center at MFC and Backup Dispatch Center at CHE P4 OCD.

3.4. Future Enhancements/Scalability

The Contractor shall provide a system design that facilitates future enhancements and scalability that support LAFD's operational growth and reduce response time to 9-1-1 calls.

3.5. Voice Radio System Interoperability

The Contractor shall provide full system integration and control of the LAFD voice radio system while also providing seamless interface and interoperability with the LAPD 700/800 MHz radio systems and the LA City Simulcast Trunked Radio System (STRS).

3.6. Functional Requirements

3.6.1. Radio Operator Positions

The Contractor shall provide the ability to use the current/existing dispatch console furniture without modification.

The Contractor shall provide the number of radio operator dispatch positions required at the MFC as enumerated in Table 2 – Primary Dispatch Center at MFC: Operator Positions and their Locations, and those required at the CHE P4 OCD, as described in Table 3 – Back up Dispatch Center at CHE P4 OCD: Operator Positions and their Locations.

Table 2 – Primary Dispatch Center at MFC: Operator Positions and their Locations

OPERATOR LOCATION	POSITIONS	AMOUNT
Dispatch, Room #220	1-37, 60, 61	39
Training, Room #222	39-51	13
Captain Desk, Room #225	52 Radio and Phone, 53 Phone only (PC provided by	2

	Contractor)	
PSO, Room #259	Radio only	1
Battalion Chief, Room #244	58 Radio only	1
Sit-Stat Re-Stat, Room #258	62 and 63 Radio and Phone	2
Battalion Chief, Room #245	57 Radio only	1
Asst. Chief, Room #249		1
Chiefs Office, Room #250	65 Radio only	1
OCD B.C. Office	38	1
FCCS CAD Dev Room, Room #241	CAD only (PC provided by Contractor)	3
Tech Control, Room #214	Maintenance	1
Equipment Room #215	Maintenance	1
AV Equipment Room #221	9-1-1 only (PC provided by Contractor)	1
AT&T Room	9-1-1 only (PC provided by Contractor)	2
Captain Room #225	CAD only (PC provided by Contractor)	1
Captain Room #227	Radio only	1
	Total Positions	**72**

Table 3 – Back up Dispatch Center at CHE P4 OCD: Operator Positions and their Locations

OPERATOR LOCATION	POSITIONS	AMOUNT
Dispatch Room	1-23	23
Public Safety Officer (PSO)	Radio only	1
Battalion Chief		1
Captain's Office		1
Captain's Office		1
Tech Control Maintenance		1
	Total	**28**

3.6.2. **Radio Channel and Trunked Talk-Group Capacity**

The Contractor shall size the console system and related equipment to provide a minimum of 84 conventional radio channels. These include:

- 20 Primary Voice Channels
- 18 Mt. Lukens Voice Backup Channels
- Los Angeles City Simulcast Trunked Radio System (STRS) P25
- 700 MHz Nationwide Interoperable Channels
- Non-Federal 800 MHz National Mutual Aid (8CALL90, 8TAC91), Los Angeles County Fire Tactical, and other miscellaneous (VHF/UHF) channels

The Contractor shall size the console system and related equipment to provide a support trunked radio systems integration / interoperability for a minimum of 120 simultaneous P25 Talk Paths (60 talkpaths for main and 60 talkpaths for backup) to allow LAFD to communicate with LAPD, Interagency Communications Interoperability System (ICIS), and Los Angeles Regional Interoperability Communications Systems (LARICS).

The list of frequencies of all LAFD Radio channels will be provided by the City during the preliminary design phase of the project.

3.6.3. **Operator Position Equipment**

3.6.3.1. ***Dispatchers, Call Takers, and Training Operator Positions***

The Contractor shall provide all dispatcher, call taker, and radio operator

training positions to be identical.

The contractor shall equip each position with:

- All required computer hardware (e.g. CPU, keyboard, monitor, mouse)
- Audio Processing Unit
- Two (2) headset jacks
- Four (4) desktop speakers
- Physical button/footswitch for Shunt activation.
- One footswitch with Tx and Mute
- One counter-top keypad with Push-To-Talk (PTT), Mute, Alert tone Transmit, select audio shunt
- Interface to long-term logging recorder
- Interface to instant recall recorder (IRR)
- Public address system interface capability
- Two headsets for each radio operator position
- Monitor and control for Mt. Lukens 18-channel backup base stations
- Gooseneck microphone, at selected positions.

3.6.3.2. ***Supervisors and Battalion Chief Positions***

The Contractor shall equip supervisor and BC positions and training room with the same radio operator position equipment, as detailed in Section 3.8.3.1, Dispatchers, Call Takers, and Training Operator Positions, with the following exception: supervisor positions will use a handset instead of a headset.

3.6.3.3. ***Other Specified Radio Operator Positions***

The Contractor shall equip radio operator positions in Public Service Office, Sit-Stat, Re-Stat, and DOC with equipment identical to that as described in Section 3.8.3.2, Supervisors and Battalion Chief Positions in the OCD.

3.6.3.4. ***Other Offices***

The Contractor shall equip radio operator positions in other offices with the same radio operator position equipment, as detailed in Section 3.8.3.1, Dispatchers, Call Takers, and Training Operator Positions, with the following exception: counter-top pad with PTT, Mute, Alert Tone, and Shunt is required.

3.6.3.5. ***Technician Positions Mobile for Maintenance***

The Contractor shall equip technician positions with same equipment as that detailed in Section 3.8.3.1, Dispatchers, Call Takers, and Training Operator Positions, with the following exceptions: installed on a suitable high quality cart to make it easy for system maintenance and parking placement for monitoring

during normal operation.

3.6.3.6. *Tech Control Monitoring Position*

The Contractor shall equip Tech Control monitoring position with the full capability of any dispatch position, as detailed in Section 3.8.3.1, Dispatchers, Call Takers, and Training Operator Positions.

3.6.3.7. *Headset Jacks and Headsets*

The Contractor shall provide the ability to use a single headset for Telephone, Radio, and DCN communication between the dispatcher console and all required peripheral systems including the Fire Station Alerting system. (See Table 4 – LAFD Headset Requirement Matrix.). Through Contractor provided API's the City will manage routing, dialing, and connection of the telephone and DCN audio.

The Contractor shall provide dispatch operator position to support up to three headset jacks: two headset jacks for Radio (Radio, DCN, and Telephony) and one for telephony only as a backup. The telephony-only jack and headset will be provided by Telco. Radio System shall arbitrate between DCN and radio.

The Contractor shall design the minimum audio level to be adjustable, and the characteristics of received audio should not be changed.

The Contractor shall ensure that each jack shall accept a non-polarized switchboard-type double-prong plug.

The Contractor shall mount the radio headset jacks underneath the console writing surface (one on each side), in a low-profile position to ensure safe user operation. The headset jack must allow users to use a headset that minimizes the effect of ambient noise on console Voice Radio Switch, thus improving the quality of audio being transmitted from the dispatch center, and allowing the dispatch console users to hear received audio more clearly.

The Contractor shall ensure that when a headset is plugged into a headset jack, the selected receive-audio is typically removed from the speaker(s) and routed to the headset earpiece. When both radio headsets are connected to a dispatch console, the same audio appears in the earpieces of both of them.

Table 4 – LAFD HEADSET REQUIREMENTS

TELEPHONY - Telephony has highest priority								
Item #	**Type Of Arbitration**	**Telephony Audio On Headset**	**Radio Tx On Headset**	**Radio Rx On Headset**	**No A/V On Headset**	**DCN Audio On Headset**	**Audio Routed To Speakers (Auto/Manual)**	**Remarks**
1	Telephony followed by DCN SCENARIO : Calltaker (CT) Logged on to ACD (Automatic Call Distributor) Queue and in the **Ready** state	Yes	N/A	N/A	N/A	Muted/ Blocked at Headset	N/A	1. Telephony has priority 2. If Calltaker is in the ACD Ready state, ACD call will always be delivered to the headset. 3. If Calltaker is on an ACD 9-1-1 call, they will be trained to complete the ACD 9-1-1 Call and go Not ready prior to picking up a DCN call. 3.. Calltaker ***must*** always be in the Not Ready state prior to picking up a Dispatch Communications Network (DCN) call. This will be re-enforced during training
2	Telephony followed by DCN SCENARIO : Calltaker Logged on to ACD Queue and in the **NOT Ready** state	YES	N/A	N/A	N/A	Muted/ Blocked at headset	N/A	1. Telephony has priority. 2. If Calltaker is on a Dialed Number (DN) call. telephony audio is delivered to the headset. 3. If Calltaker is on a DN call, they will be trained to complete the DN Call and or place the call on hold prior to picking up a DCN call. This will be re-enforced during training

3	Telephony followed by DCN SCENARIO : Dispatcher Logged on to Radio (not logged onto ACD)	YES	N/A	N/A	N/A	Muted/ Blocked at headset	N/A	1. Telephony has priority. 2. If Dispatcher is on a DN call telephony is delivered to the headset. 3. If Calltaker is on a DN call, they will be trained to complete the DN Call and or place the call on hold prior to picking up a DCN call. This will be re-enforced during training
4	Telephony followed by Radio Tx (Transmit) *SCENARIO : Dispatcher logged on to Radio*	Yes	No	N/A	N/A	N/A	N/A	1. If Dispatcher is on a DN call, telephony is delivered to the headset. 2. When Dispatcher keys the MIC button while on a DN call, the DN caller will not hear the Dispatchers Radio Tx audio.
5	Telephony followed by Radio Rx (Receive) SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	N/A	N/A	N/A	Yes	Automatic (Shunt) Audio Mode 1. If Dispatcher is on a Telephony/DN call, telephony audio is delivered to the headset. 2. If Radio Rx audio is received while on a DN call , the Radio Rx audio is shunted to the radio speakers
6	Telephony followed by Radio Rx SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	Yes	N/A	N/A	No	Manual (Headset) Audio Mode 1. If Dispatcher is on a DN call, telephony is delivered to the headset. 2. If Radio Rx audio is received while on a DN call, the Radio Rx audio is delivered to the headset. (Both Telephony and Radio are present on the headset)

DCN (Dispatch Communications Network) - Telephony has highest priority								
Item #	**Type of Arbitration**	**Telephony Audio on Headset**	**Radio Tx on Headset**	**Radio Rx on Headset**	**No A / V on Headset**	**DCN Audio on Headset**	**Audio Routed to Speakers (Auto/Manual)**	**Remarks**
1	DCN followed by Telephony SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	No	N/A	Muted/ Blocked at headset	N/A	1. If DCN is selected when there is no telephone audio present, DCN audio will be delivered to the headset. 2. It will be mandatory that only one audio source (DN/DCN) be selected at any one time. This will be re-enforced during training 3. If a DN needs to be selected while on a DCN call, Calltaker/Dispatcher is required to either clear or disconnect the DCN caller. Otherwise Telephone has priority and DCN must be muted or blocked at the headset.
2	DCN followed by Radio Rx SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	No	No		N/A	Yes	Yes	Automatic (Shunt) Audio Mode: 1. If Dispatcher is on a DCN call, DCN audio will be delivered to the headset. 2. If Radio Rx is presented while on a DCN call, Radio Rx is shunted to the radio speakers
2	DCN followed by Radio Rx SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	No	No	Yes	N/A	Yes		Manual (Headset) Audio Mode: 1. If Dispatcher is on a DCN call, DCN audio will be delivered to the headset. 2. If Radio Rx is presented while on a DCN call, Radio Rx will also be delivered to

								the headset (Both DCN and Radio are present on the headset)
3	DCN followed by Radio Tx SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	No	Yes	No	N/A	Yes	N/A	Auto & Manual Mode 1. If Dispatcher is on a DCN call, DCN audio will be delivered to the headset 2. If Dispatcher keys the MIC to transmit radio while on a DCN call, the DCN caller will hear the Radio Tx audio
Radio								
Item #	**Type of Arbitration**	**Telephony Audio on Headset**	**Radio Tx on Headset**	**Radio Rx on Headset**	**No A/V on Headset**	**DCN Audio on Headset**	**Audio Routed to Speakers (Auto/Manual)**	**Remarks**
1	Radio Tx followed by telephony DN SCENARIO : Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	No	N/A	Yes	No	Automatic Mode; 1. When a Dispatcher keys the MIC button while on a DN call, the DN caller will not hear the Dispatchers Radio Tx audio.
3	Radio Rx followed by Telephony Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	No	N/A	No	Yes	Automatic (Shunt) Audio Mode 1 . If a telephone/DN button is selected while receiving Radio Rx audio, the telephone/DN audio is delivered to the headset and the Radio RX is shunted to the radio speakers.
3	Radio Rx followed by Telephony Dispatcher logged on to Radio (not logged onto ACD)	Yes	No	Yes	N/A	No	No	Manual (Headset) Audio Mode 1. If Dispatcher is on a radio call, radio Rx audio is delivered to the headset. 2. If a telephone/DN button is selected while receiving Radio Rx audio on the

								headset, the telephone/DN audio is delivered to the headset (Both Telephony and Radio are present on the headset)
3	Radio Rx followed by DCN Dispatcher logged on to Radio (not logged onto ACD)	No	No	No	N/A	Yes	Yes	Automatic (Shunt) Audio Mode: 1. If Dispatcher is on a DCN call, DCN audio will be delivered to the headset. 2. If Radio Rx is presented while on a DCN call, Radio Rx is shunted to the radio speakers
3	Radio Rx followed by DCN Dispatcher logged on to Radio (not logged onto ACD)	No	No	Yes	N/A	Yes	No	Manual (Headset) Audio Mode: 1. If Dispatcher is on a DCN call, DCN audio will be delivered to the headset. 2. If Radio Rx is presented while on a DCN call, Radio RX will also be delivered to the headset. (Both DCN and Radio are present on the headset)

NOTE:
1. Headset Interface Unit (HIU) will arbitrate Radio, DCN (Dispatch Communications Network), and Telephone audio
2. Telephony has highest priority when logged onto ACD (Automatic Call Distribution)
3 Use of DCN requires Calltaker position to be in the ACD NOT READY state and or DN (Dialed Number button on telephone set)
4. Dispatcher cannot be logged in as a Calltaker
5. Calltaker cannot be logged in as a Dispatcher. (Wingman has speaker capability only)
6. Audio Visual (AV) audio will not connect to the HIU.

3.6.3.8. ***Headset Interface***

The Contractor shall design the headset interface to allow dispatchers to plug a headset directly into the console instead of having to switch between various communications systems. The interface shall automatically coordinate and prioritize communications over telephone, radio, and the DCN, and allow the user some freedom to override automatic prioritization.

LAFD and ITA have developed operational requirements for the headset interfaces. These headset interfaces are designed to operate within the matrix parameters. HIUs will arbitrate Radio, DCN and Telephone audio (please refer

to Table 4 – LAFD Headset Requirements Matrix).

The hardware specific design of the HIU shall be completed during detail design of the LAFD Voice Radio Switch.

3.6.3.9. ***Personal Computer (PC)***

The Contractor shall provide a dedicated CPU for each radio operator position that runs on the latest Operating System approved by the City and any City-required virus and/or malware protection software.

Due to space limitations in the training and test environments, the Radio and CAD software will cohabitate on the same physical CAD PC.

3.6.3.10. ***Monitor, Keyboard, and Mouse***

The Contractor shall provide a monitor, mouse, and keyboard for each position.

The Contractor shall use a City-provided KVM to allow sharing one monitor, keyboard, and mouse with multiple CPUs where needed.

3.6.3.11. ***Speaker Requirements***

The Contractor shall provide the Voice Radio Switch with four (4) speakers, through which audio is presented to a dispatch console.

The Contractor shall route audio associated with different sources to different speakers at the operating position.

The Contractor shall allow a dispatch console user to choose which speakers are to be used for a given resource. The Select Audio can be fixed to a specific, pre-defined speaker. Monitor audio can be routed to any of the monitor speakers.

3.6.3.12. ***Unselect Speaker***

The Contractor shall dedicate a single speaker as the "Unselect" speaker. When a resource is not selected, its audio shall be sent to a speaker dedicated as the unselect audio destination for that resource.

3.6.3.13. ***Select Speaker***

The Contractor shall dedicate a single speaker as the "Select" audio destination for all resources selected by that console operator. Whichever radio resource is currently selected will have its audio presented in that speaker.

3.6.3.14. *Monitor Speaker*

The Contractor shall provide two (2) monitoring speakers for other audio not needed to be on the operator headset.

3.6.3.15. *Footswitch*

The Contractor shall provide a heavy-duty, non-skid pedal footswitch at each console operator position. The foot switch shall provide Mute, and PTT functions. Shunt operation from a footswitch is desired but detailed operation can be determined during the Detailed Design process.

3.6.3.16. *Commercially Available Accessories*

The Contractor shall provide the ability to use commercially available accessories, including but not limited to, a USB microphone, USB headset, USB footswitch, power supply, and speakers.

3.6.3.17. *Auxiliary Input/Output Hardware*

The Contractor shall support auxiliary input/output hardware that is independent of the dispatch positions in a system that can be accessible to multiple dispatch positions.

Allow auxiliary inputs and outputs to control external devices via relay closures and sense the state of external devices via input buffers from dispatch operator positions.

3.6.4. **Additional Icons**

The Contractor shall provide additional voice resource icons and the necessary connections to integrate with other systems as required for LAFD operations.

3.7. **Operational Requirements**

This section provides the minimum operating requirements of the LAFD radio dispatch console system.

3.7.1. **General Operator Features**

The Contractor shall provide all console positions the ability to access any active Tx/Rx channel at the console for transmit and receive operations.

The Contractor shall provide all console positions the ability to transmit and receive on one or more Tx/Rx channels, up to the maximum number of active channels at

the console.

The Contractor shall allow each console to transmit on any channel, on a first-come, first-served basis. Lock out all other consoles from transmitting on that channel until the first transmission is completed (PTT is released).

The Contractor shall allow all console positions to access one or more Rx-only channels, up to the maximum number of monitor channels at the console, for monitor-only operation.

The Contractor shall allow all console positions to load predefined screen configurations without being taken off-line or losing communications on selected channel(s) while loading a new screen configuration.

The Contractor shall allow for the radio operator position not being used and a resource is being added to a configuration, a console may be taken offline for a maximum of 30 seconds while the new resource is added.

The Contractor shall design the system so that dispatchers can perform tasks quickly and with no interruption.

The Contractor shall ensure that configuration files can be loaded with minimal or no disruption.

The Contractor shall allow any console position to select and display a Tx/Rx channel(s), multiple channels, or a pre-selected group(s) of channels with a single control, up to the maximum number of active channels at the console.

The Contractor shall provide all console operator positions the capability to select the 20 LAFD Primary Radio channels or 18 Mt. Lukens Backup Radio channels to meet their operational requirements.

The Contractor shall ensure that the user can execute any primary control function with no more than a single operation or keystroke on preselected channels, e.g. multiple channel or group transmit selection.

The Contractor shall equip all console positions with a predefined control layout. Capability to assign channels for all consoles shall be identical.

The Contractor shall allow the status of all selected channels to be visible to the operator at all times either by displaying the channel module onscreen or representation in the STAT list. Minimum status display is: Channel Select, Transmit Active, Call, and Busy. Display all channel and console status indications on a computer monitor.

The Contractor shall allow the operator to control consoles through an input device, such as a standard keyboard, 3-button mouse with scrolling feature, or touchscreen.

The Contractor shall activate an audible tone and cause an error message or indication to be displayed when there is an error in a system entry by a console operator such as PTT failure, PTT override, etc.

The Contractor shall transmit and receive audio at one position that is available and heard at parallel positions that have the same channel selected.

The Contractor shall automatic 9-1-1 telephone assignments shall not be allowed unless a headset has been plugged into a headset jack-box and user ACD login has occurred.

The Contractor shall ensure consoles are capable of transmitting a distinctive alert tone for emergency traffic as required by NFPA 1561.

The Contractor shall allow all consoles to transmit three (3) pre programmed alert tones over the air as long as an Alert tone-switch is depressed. An alert tone may be transmitted over any selected or combination of selected channels. Programming of the three alert keys may be from any tone in the following list:

- 1004 Hz Continuous tone
- 600 Hz Continuous tone
- 1004 Hz Beeps at a 2 Hz Rate
- 600 Hz beeps at a 2 Hz Rate
- 900/1500 Hz High or low at a 2 Hz Cycle rate
- 1200 Hz Continuous tone.
- 1004 Hz 3 beep tones only

The Contractor shall ensure consoles are intuitive for trained dispatchers to operate with guides located within the dispatch application itself

The Contractor shall provide each console position with a shunt/auto-off feature controlled by an application program installed in the position's computer.

3.7.2. **System Control Capability**

3.7.2.1. ***Console Status Display***

At a minimum, provide the following system functions and visual status indications at all console positions. Other methods of status may be offered.

3.7.2.2. ***Receive Functions***

- Channel select (Channel to be monitored)
- Audio Call (Received audio on line)
- Channel Busy (Other console transmitting on Channel)

3.7.2.3. ***Transmit Functions***

- Channel Select (Tx/Rx channel)
- Simulcast Select (Pre-programmed channels)
- Channel Busy (Other position transmitting)
- Transmit (Position can transmit)
- Repeat Enable/Disabled (Channel repeat disabled/enabled)
- Priority Tx

3.7.2.4. ***Graphical User Interface (GUI)***

Employ a GUI for displaying information to and accepting commands from console operators.

3.7.2.5. ***Resource Assignment***

Provide a resource assignment feature with the ability to monitor and control the following radio resources:

- Analog Conventional Channels
- Broadcast call/All call
- Trunked Talk-group call
- Trunked individual calls

Allow all console operator positions to select the radio channels dynamically for single-channel, multi-channel, or group-select operation with easy access to set up changes.

Provide visual indication of audio activity on a radio resource that allows user to see at a glance what the status of a resource is at any moment.

3.7.2.6. ***General Transmit***

Provide a general transmit feature to initiate a voice transmission on the selected resources with the footswitch, the counter top keypad push button, or GUI.

3.7.2.7. *Instant Priority Transmit*

Provide instant or high-priority transmit to allow quick transmission on a specific channel regardless of its select or in-use state resources with the footswitch, the counter top keypad push button, or GUI.

3.7.2.8. *Supervisory Functions*

Provide the supervisory consoles the capability of Primary/Secondary Supervisor Hierarchy feature to allow supervisory personnel to priority-override the transmit function of other operators or users regardless of their current state. Other details of the administrative function will be defined in the Detailed Design Document.

3.7.2.9. *Priority Levels*

Provide Transmit Priority hierarchy level capability for different types of transmission on the same dispatch console or between dispatch consoles. This allows a higher priority transmission to take over resources from a lower priority transmission.

The following priority levels, from highest to lowest are:

- Primary supervisor and Battalion Chief console instant transmit
- Secondary supervisor console instant transmit
- Dispatcher console instant transmit
- General transmit on any type of console
- Auxiliary Inputs and Outputs (AUX I/O)

3.7.2.10. *Single Select*

Design the Single-Select feature that allows only one radio resource to be selected at a time, and to route audio on the resource to the selected speaker. When a resource is single-selected, the previously selected resource becomes deselected. This audio shall be easily recognized from the other audio sources at the dispatch console.

Provide user controls so that the user can define their own audio reception profile by selecting a single audio source, whether conventional or talk group, to be heard on a selected speaker or headset (Single Select).

3.7.2.11. *Multi-Select*

Provide a Multi-Select feature to identify and select multiple resources simultaneously. A dispatch console is required to support multiple Multi-Select

groups, each of which supports multiple, potentially overlapping resources. Multi-selecting a group of resources shall route the inbound audio on the multiple resources to the select speaker. Only one Multi-Select group shall be active at a time.

Provide user controls so that the user can define groups of radio resources that can all be heard on a selected speaker or headset.

3.7.2.12. ***Channel Select***

Provide a Channel Select feature that selects the active transmit/receive frequency of a conventional base station via in-band signaling (Dual Tone Multi-Frequency (DTMF) or function tones).

3.7.2.13. ***Volume Control***

Provide audio controls including volume and mute. Compartmentalize them so that audio quality can be maintained and interference, acoustic feedback, and interruptions are minimized. Provide activation capability of Automatic Gain Control (AGC) for transmit and receive audio at the console.

3.7.2.14. ***Individual Resource Volume Control***

Provide an Individual Resource Volume Control feature to adjust the level at which each resource is received at a speaker's input. When a resource is selected, its volume shall be at a full volume. However, the level to the operator headset shall not be at a level damaging to the listener.

3.7.2.15. ***Mute***

Provide a Mute feature that mutes traffic on any channel.

3.7.2.16. ***All Mute***

Provide an All Mute feature that mutes all audio on resources that are not currently selected. It shall deactivate automatically after a certain amount of time elapses, typically 30 seconds.

3.7.2.17. ***Cross Mute***

Provide a Cross Mute feature that prevents acoustic feedback when dispatch consoles are physically located near each other.

3.7.2.18. ***Patch***

Provide the ability to patch communication between trunked and/or conventional radios that are normally unable to communicate with each other due to different features, programming, or even different frequency bands.

Provide the ability to transmit all audio on one resource to all other resources in the patch group and ensure that patches are automatically reestablished, if interrupted, to minimize disruption.

Provide the ability to predefine and automatically reinitiate patches each time a dispatch position is restarted.

3.7.2.19. ***Selective Intercom Call***

Provide a Selective Intercom Call feature that allows dispatch console operators to speak privately with each other through the dispatch intercom system.

3.7.2.20. ***All Call Intercom***

Provide a Group Intercom Call feature that allows a dispatch console user to have one-way voice communication with all other operator positions through their dispatch consoles.

3.7.2.21. ***Private Line Select***

Provide a Private Line Select capability that selects the Private Line code for a Mutual Aid conventional resource. Selecting a Private Line on a conventional resource shall cause the dispatch console to transmit/receive audio only to the subgroups of radios using the selected Private Line code.

3.7.2.22. ***Wildcards***

Provide a Wildcards feature that activates miscellaneous functions that a conventional base station can perform (e.g. to turn a relay on/off at the base station connected to external equipment).

3.7.2.23. ***Multi-Frequency Conventional Base Stations***

Provide the dispatch console with the capability to access and control base stations.

Design the console to select and broadcast on any number of frequencies.

3.7.2.24. ***Display Radio Unit ID***

Immediately display an indication of an emergency activation showing the unit ID associated with an inbound radio call. When an alias is used for the unit ID, display the alias instead of the unit ID.

3.7.2.25. ***Console Unit ID (P25 Feature)***

Display an identifier unique to the console being used when the console user transmits on a radio channel and when the user initiates an individual call to another console.

3.7.2.26. ***Emergency Alarm***

Alert console users of a critical situation needing immediate attention with an emergency alarm.

Provide immediate prioritization and resolution of emergency communications by use of both visual and audible indications.

Provide the ability to bypass the standard console interface to enable specific controls for responding to an emergency call, initiating an emergency call, and ending an emergency call.

3.7.2.27. ***Signaling Protocol***

Design the system to be compatible with LAFD mobile and portable radios' signaling protocol (currently, MDC-1200) to display both radio ID and alias identifications for incoming radio messages.

Provide signaling protocol on the twenty (20) Fire channels and the eighteen (18) Mt. Lukens Backup channels.

Equip the Voice Radio Switch with a redundant decoder and comparators for emergency trigger channel.

Provide decoders capable of decoding up to 9,999 different IDs and alias identities. The hardware numbers and alias names of the radio units transmitting on each of the twenty (20) LAFD Primary channels and eighteen (18) Mt. Lukens backup TAC channels shall be displayable on all consoles.

Provide a backup to primary decoder to ensure that no Emergency Triggers or alarms are missed or unacknowledged.

Annunciate an alarm at the Supervisor and Maintenance Position if both

decoders fail to decode the Emergency Trigger Signal.

3.7.2.28. ***Mute Emergency Trigger Display***

Display an Emergency Trigger Signal at all consoles for each radio.

Make both hardware and alias ID from at least the last ten (10) transmissions available for simultaneous display.

Display a pop-up channel module for the Emergency Trigger channel at all positions programmed for a pop-up option. An Emergency Trigger shall cause the module to sound an audible alarm at all positions programmed for the audible alert option.

Allow audio alarms at all console positions to be cleared by any console operator, whereas allow visual alarms to be cleared by supervisors only. Allow the silencing of the audible alarm and the reset of each of the ID displays.

3.7.2.29. ***DTMF Encoder***

Allow all console operator positions to generate Dual Tone Multiple Frequency (DTMF) signals to control radio transmissions.

3.7.2.30. ***Secure Capability in the Dispatch Console***

Allow conventional channels and P25 channels to be encrypted on all transmit/receive voice transmissions.

3.7.2.31. ***Visual Alert (Clear Audio Alert)***

Provide visual indications when any call is in the clear mode for P25 and conventional channels using the encryption system.

Alert the dispatch console user that a call is unencrypted.

3.7.2.32. ***Aliasing***

Allow aliases to be used in the configuration, operation, and management of the voice radio system in both conventional and trunk mode. An alias is an alpha-numeric text that is associated with some element of a console subsystem (e.g., a user, a conventional radio channel, or a talk group).

Perform updates of the Radio Alias IDs by the LAFD CAD system automatically via the Application Programmer Interface (API). The City is responsible for developing the API integration. The Vendor shall provide API technical support

to the City.

Provide a means to edit the Radio Alias Database. Updating from the Voice Radio System to the Voice Radio Switch shall be transparent and shall not experience delay as this is a critical part of the operations.

3.7.2.33. ***Log-In and Log-Out***

Require user account name and password information to be entered before the console can be used.

Require positive information to allow log-out (but not password).

Allow an administrative user to create accounts for the different users of the system and to assign different capabilities and access rights to them.

3.7.3. **Mobile Console**

Allow the ability to have direct radio console access for command post type incidents offsite in order to be able to access remote mobile radio setup from Dispatch Centers.

3.7.4. **Radio Communications through Mobile Phone**

Support at least 40 WAVE or more users, with access to at least 20 voice talk paths that would be tied to the new consoles.

3.8. **Interface Requirements**

3.8.1. **Customizable User Interface**

Ability to customize graphical user interface by agency and/or user preference to show details of status on a per-channel basis.

3.8.2. **Long-Term Logging Recorder Interface**

Interface to a fully redundant external Long-Term Logging Recorder.

Allow the audio that appears on the LAFD Voice Radio Switch output to be configurable.

The Voice Radio Switch logging interface is also required to present Trunked voice radio traffic, talk group, Caller ID, and Radio hardware ID.

3.8.3. **Short-Term Recorder Interface (Instant Recall Recorder)**

Include Instant Recall Recorder capability as part of the dispatch operator positions.

Provide the radio audio interface to the IRR via an analog 2-wire interface.

3.8.4. **LAN Interfaces**

Provide a LAN interface to communicate with positions for the purpose of configuration data downloads/uploads. A failure of the LAN interface shall not interrupt voice dispatch operations; therefore, provide a redundant LAN interface for this application.

3.8.5. **CAD Interface**

Provide an ATIA data stream that allows for the near real-time exchange between the LAFD CAD and the Voice Radio System of supported information, such as radio alias maintenance and push-to-talk ID's.

Include the capability of using a CAD interface for other applications in the future that shall, at minimum, allow the CAD to receive Unit numeric ID, Unit Alias, PTT status (normal or emergency), radio channel addresses, PTT Start-time, and PTT End-time.

3.8.6. **External Time Interface**

Use the existing Master Time Base (MTB) for dispatch console synchronization.

Accept a signal by utilizing an RS232 serial interface, Netclock Format protocol, or Ethernet network interface.

Conform to the NENA Master Time Source Standard for Public Safety agencies.

3.8.7. **Channel Interface**

Define all analog and digital channel interfaces with the assistance of ITA. Channel interfacing for existing analog channels may be two- or four-wire, tone or E&M keying, 600-ohm balanced audio.

3.8.8. **DCN Interface Requirements**

Interface to both legacy Redcom and the new Redcom HDX Gateway IP system, along with the associated user interface software.

3.8.9. **9-1-1 Telephony Interface**

Interface with the Telephony Junction Box (by Telco) for standard radio interface. Provide off-hook indication to the Contractor Dispatch Console system.

3.8.10. **ACD Not Ready Interface**

Interface with the 9-1-1 Telephone System to provide the “ACD Not Ready” function.

3.8.11. **Phone Switch Interface**

Interface with City-provided phone switch with Session Initiation Protocol (SIP).

3.8.12. **Audio Level and Quality at Headset Interface**

Receive audio level shall not exceed more than 3 dB at the headset interface for any variation of input signal. Audio level and quality will be presented to the City for testing and acceptance.

3.9. **Monitoring and System Management**

3.9.1. **Hardware Fault Manager**

Monitor, diagnose, and report the status of all hardware elements in the system, including the dispatch operator positions, and major common equipment assemblies that support the Voice Radio Switch elements.

3.9.2. **System Monitoring and Diagnostics**

Monitor and log the status of all software processes running on the various hardware elements in the system. Report status changes to the Voice Radio Switch fault manager.

Changes in the status of software processes on a device shall be recorded internally, manually printed, and be used for troubleshooting problems. Loss of one or more audio cards shall cause an automatic switch to standby units, and error messages and alarms shall be generated.

Distribute diagnostic routines among various microprocessors and other independent and redundant subsystems, so that they shall not depend on one central diagnostic circuit. Diagnostic messages shall be easy to understand.

Fault messages or detection notices requiring translation shall not be acceptable. Fault detection shall automatically institute routines to minimize outages.

Include an entire suite of fault management and monitoring software. The Contractor's suite combined with their NMS reporting software shall meet or exceed the requirements of maintenance personnel.

Provide all documentation, firmware, and software in a digital media format in case it is required for system recovery.

3.9.3. **Links Integrity Monitoring**

Monitor all internal links used in the Voice Radio Switch system, not including City provided Aviat / Cisco equipment, in the same manner as the network elements. Any failure in these links needs to be reported to the System Manager. Error and failure messages shall be collected and processed on detection so that automatic switchover to redundant equipment shall occur without affecting system operation.

3.9.4. **Self-Healing Actions**

Automatically take action to remedy failures detected by fault management routines. If a fault is detected, the system control software shall generate an automatic switchover to the standby system.

3.9.5. **Configuration Management**

Design the Voice Radio Switch to be configured by an application residing on the System Manager.

Allow user to use the configuration application to define what hardware is present at each element and the capabilities of each element.

Distribute changed information through the system manager to all the Voice Radio Switch sub-system elements that require it.

Install Monitoring and System Management at MFC and CHE P4 Tech Control Area.

3.9.6. **Statistics Management**

Provide channel utilization information for use by the operation management. This data shall be stored on the Technician position/Tech Control console. The report data shall be accessible in a universal data format to be used by other systems to generate reports and also available for printing in the form of statistics to benefit management operations.

At a minimum, provide the following statistics as part of the Statistics and Management package:

- Total uplink transmissions per channel
- Total downlink transmissions per channel
- Total elapsed time of uplink transmissions per channel
- Total elapsed time of downlink transmissions per channel
- Total Emergency Trigger Alarm activation

Elapsed time measurements shall be accurate to a tenth of a second.

3.10. Error Logging

Record all system messages on the System Manager PC in a mutually agreed database. A query of the database and custom report may be made at any time using a licensed copy of application software supplied by Contractor. An error message shall contain all details required to correct the error. The error messages shall be easy to understand.

3.11. Interoperability and Trunking Capabilities

Provide the capability to interface with a P25 Trunked RF System.

Be compatible and interoperable with the following trunking systems:

- LAPD Motorola P25 System
- City STRS Harris P25 System

3.12. Reliability

Design system in such a way that no single component has the ability to disrupt service to more than a single position or a single radio channel.

Design system infrastructure, including dispatch console systems, such that a single point failure will not disrupt day-to-day or emergency operations in any way. T

Design critical components with redundancy in order to provide high system availability.

Design the system so that there is no single point of failure.

3.13. Maintainability

Allow for maintenance with no disruption of ongoing dispatch operations.

All cards utilized in the equipment card cages shall allow for removal or insertion (hot swappable) while the system is powered up and operational without interruption to operation of the system.

Route all audio and IP signals through jack fields and patch panels for ease of maintenance and testing.

When IP technology is used, provide gateway, routers, LAN switches, etc. with failover to a redundant unit in the event the primary should fail.

Provide visual and audible alarms on the console to alert the user of system problems. Allow the console to provide alarm outputs to external devices.

3.14. AC Power

Provide detailed information regarding electrical loads at each location and the type of power required.

3.15. HVAC Requirements

Provide detailed information regarding heat loads, ventilation, and air conditioning requirements imposed by Contractor-furnished equipment.

3.16. Grounding

All essential communications equipment shall be bonded to the single-point facility ground system in accordance with R56 Standards. The Contractor shall test the grounding system for compliance and identify issues requiring correction to the City.

Components shall support two separate ground systems: Electrical supply ground, used for compliance to electrical codes and user safety, and equipment ground, used to distribute a common grounding reference among all communication systems.

Utilize the Equipment Grounding Backbone System at MFC that is already present in the equipment room and under raised floor in the LAFD dispatch center and training areas.

Electrically bond and ground all equipment, including cabinets, metal conduit, equipment racks, cable trays, battery racks, shelves, and surge suppression on all Radio Tie Lines, directly to the ground bus.

Survey the grounding system at both MFC and CHE P4 and provide a report.

3.17. Hardware Requirements

All system components must be new. Discontinued products or refurbished or remanufactured components will not be accepted.

Back up critical components with hot standby components that will automatically come online in the event of a failure in the primary unit.

The remote site equipment shall be designed to function under extreme operating temperature ranging between -22 to 140F.

All applicable equipment supplied for Voice Radio Switch by Contractor shall be UL-listed or approved by the City Electrical Laboratory.

Warrant all equipment to perform according to the manufacturer's published specifications.

3.18. Equipment Certifications

All hardware elements shall be certified to meet the requirements for UL and FCC part 15 Class A for EMC Emissions & Immunity Standard.

3.19. Software Requirements

Provide Dispatch Console Software Licenses for each software program. The software used on the dispatch console shall allow encryption algorithms to be added or upgraded in existing secure-capable dispatch consoles for security of messages.

Provide a list of Operating System Level software installed on all network components and the latest configuration file (soft copy) for the Dispatch Console that will be used in the event of any failures.

3.20. Test Equipment and Spare Parts

Provide all test equipment and tools necessary for City Technicians to monitor, test, and maintain the system.

All spare parts shall be brand new with no manufacturer-discontinued items. No refurbished items shall be provided.

Replace discontinued items with manufacturer-recommended replacement parts that are fully compatible to the delivered equipment.

3.21. Equipment Inventory

Provide personnel to receive and inventory the equipment, including spare parts, test equipment and tools, move it to a mutually agreed designated location if required/necessary, and inspect it for damage. Replace all equipment that has been damaged at no additional cost to the City.

3.22. Mutual Aid System

Integrate with seven (7) 800 MHz Harris Master III repeaters, Mutual Aid (MA) frequencies at Verdugo, and San Pedro Hills sites that are interconnected on the IMC Harris switch at CHE-19th floor.

Allow access to MA channels from the dispatch consoles or from the Harris C3 Maestro dispatch console located at MFC. A list of MA Channels that shall be connected to the Dispatch system will be provided at the time of design.

Design dispatch system to be capable of integrating more MA channels in the future.

Section 4. Recording and Logging System

4.1. General

Replace the existing enterprise logging and recording system with a new system that can provide full functional parity with the current recording system.

4.2. Long-Term Recorder

Record the conventional voice radio traffic, channel number and Radio Hardware ID, Dispatch Communications Network (DCN), telephony, intercom, and all other audio on the Long-Term Recorder.

All recordings should be retrievable via metadata, including, but not limited to, user information, incident number, time stamp, and Automatic Number Identification (ANI)/Automatic Location Identification (ALI).

Record audio and video for telemedicine calls.

Integrate recorder with the Master Time Base for accurate time logging.

4.3. Short-Term Recorder (Instant Recall Recorder)

Provide Instant Recall Recorder functionality using the 9-1-1 telephone system. Provide the ability to instantly recall audio, video, and associated data such as PTT ID, resource name, time, etc. of any audio source heard through the console for a minimum of four hours.

Allow each Radio Dispatch position to play back audio and video from at least four different sources (e.g., radio, DCN, telemedicine, and telephone). This includes conventional and trunked radio communications.

4.4. Audio and Video Recording

Provide a single enterprise recording system that records all audio and video from both MFC and OCD.

Provide the ability to record a minimum of 120 simultaneous conversations from all available sources.

Provide the ability to record metadata associated with each recording, such as, but not limited to, identification, user, date and time information.

Provide the ability to save and share recordings in standard audio and video formats, such as .mpeg, .wav, and .mp4.

4.5. Redundancy and High-Availability

Provide system redundancy and high-availability to ensure continuous recording in the event of equipment or component failure.

4.6. Long-Term Recording Retention Period

Provide the ability to store all recordings online for a minimum of ten (10) years in a fully searchable and retrievable format without requiring use of special retrieval from archive.

Provide the ability to store all recordings offline indefinitely beyond ten (10) years in a fully searchable and retrievable format that may require the use of an archive system.

4.7. Recording Playback

Provide the ability for authorized users to search and playback recordings from any network-connected workstation without the use or installation of specialized software.

Provide playback capability for the archived recordings even after upgrading or replacing the logging recorder in the future.

4.8. Screen Recording

Provide the ability to record and synchronize the playback of the user's onscreen activity from the dispatch console (e.g. CAD, radio console).

4.9. Quality Improvement

Provide a replacement system for the current dispatch quality improvement system that allows for the monitoring, auditing, and rating of dispatcher performance.

APPENDIX D

CONTRACTOR PROPOSAL (APRIL 6, 2022)

Motorola Solutions, Inc.
725 S. Figueroa St., Suite 1855
Los Angeles, CA 90017
USA

April 6, 2022

Alfonso Ruiz | Battalion Chief
Fire Communications Dispatch Support Section
Los Angeles Fire Department
500 E. Temple St., Los Angeles CA 90012

Subject: LAFD Voice Radio System Upgrade

Dear Chief Ruiz:

Motorola Solutions, Inc. ("Motorola") is pleased to present Los Angeles Fire Department (LAFD) the following proposal for upgrade of your current Analog/Conventional 800 MHz Radio System.

As a longtime partner of the City of Los Angeles Fire Department, Motorola Solutions understands the LAFD's need to maintain a reliable mission critical voice radio system. Many of the components of the existing 800MHz analog conventional simulcast system are passed their end of life and end of support dates.

Our solution provides a combination of hardware, software and services which includes the following:

- Upgrading the aging voters and transceivers at the prime site and each of the nine remote sites as well as expand the System to feature twenty (20) total channels across the nine (9) sites.
- Upgrade to Motorola's G-Series radio platform. The G-Series radio platform features the same technology currently in use by the Los Angeles Police Department.
- One hundred (100) CommandCentral AXS Dispatch consoles to replace your existing consoles and further grow interoperability between LAFD and LAPD.

This proposal is subject to the terms and conditions contained herein and the Agreement between the City of Los Angeles and Motorola Solutions, Inc., for LAFD Voice Radio System Upgrade ("Contract") as further described in this document and shall remain valid through June 30, 2022. LAFD may accept this proposal by issuing a purchase order incorporating the Contract and this proposal. Motorola Solutions would be pleased to address any concerns LAFD may have. Any questions can be directed to your Motorola Account Executive, Joseph Warner at 312-204-9300.

We thank you for the opportunity to furnish the Los Angeles Fire Department with "best in class" solutions and we hope to strengthen our relationship by implementing this project. Our goal is to provide you with the best products and services available in the communications industry.

Sincerely,
Motorola Solutions, Inc.

Neil Thomas
Vice Presdient, West Region

MOTOROLA SOLUTIONS

LOS ANGELES FIRE DEPARTMENT

VOICE RADIO SYSTEM UPGRADE

APPENDIX D - CONTRACTOR PROPOSAL **APRIL 6, 2022**

PS-000120922

TABLE OF CONTENTS

Section 3

Section 4

Section 5

SECTION 1

EXECUTIVE SUMMARY

As a longtime partner of the City of Los Angeles Fire Department, Motorola Solutions understands the Departments need to maintain a reliable mission critical voice radio system. Many of the components of the existing 800MHz analog conventional simulcast system are passed their end of life and end of support dates. Based upon the LAFD commissioned Radio Infrastructure Assessment conducted by Gartner, Motorola is providing this proposal to allow LAFD and the City's Information Technology Agency to upgrade the end-of-support simulcast system equipment.

LAFD's existing simulcast system consists of 18 channels across nine (9) transmitter site locations. Six (6) of those sites contain all 18 channels while the remaining three (3) sites contain 14 channels. Due to the aging nature of the Radio System, the primary objective of this proposal is to replace the aging voters and transceivers at the prime site and each of the nine remote sites. The secondary objective of this proposal is to expand the System to feature twenty (20) channels at all nine sites. If a site does not have enough utility power capacity to handle expansion from its existing channel count the expansion transmitters will be installed but not cabled for power. The channels will be available for activation once adequate power is available. Based upon Gartner's report to LAFD, modifications to the backup system has not been included in this proposal.

Motorola has included our G-Series radio platform in this offering. The G-Series radio platform included features the same technology currently in use by the Los Angeles Police Department. This common ASTRO® platform, along with ISSI, inherently increases interoperability options between the two city agencies. To further the interoperability between LAFD and LAPD Motorola has included optional pricing to upgrade LAFD's dispatch consoles to the CommandCentral AXS IP based dispatch console. The AXS Dispatch Console functions on the same underlying Radio System Platform console currently in use by LAPD. Operating on the similar platform would allow LAPD and LAFD to dispatch from any LAPD or LAFD dispatch facility. This would provide unparalleled reliability and redundancy in the event of a dispatch center failure our mutual aid incident.

The following sections of this proposal are intended to provide a detailed description of the efforts and costs associated with the simulcast system upgrade. Motorola has designed the upgrade to ensure that the net power, tower, and shelter loading does not increase at any of the LAFD sites. Motorola looks forward to working with LAFD and ITA to refine this proposal and implement the voter upgrade.

SECTION 2

ASTRO25® VRS RADIO SYSTEM

2.1 ASTRO 25 INFRASTRUCTURE

Motorola Solutions, Inc. (Motorola Solutions) proposes our ASTRO® 25 platform to provide secure and reliable communications for the Los Angeles Fire Department. ASTRO 25 offers a future-ready, wireless platform that combines a uncompromising, real-world performance and reliability.

ASTRO 25 offers LAFD a Project 25(P25), standards-based Internet Protocol (IP) solution with a flexible, modular network. ASTRO 25 can expand to accommodate additional radio users, increased geographic coverage, enhanced data applications, and connectivity to other networks, ensuring that LAFD will have efficient and cost-effective communications for decades to come.

ASTRO 25 also provides advanced call processing capabilities designed to meet the needs of public safety. On an ASTRO 25 network, first responders can share voice and data communications between members of the same team, across an agency, or among different agencies. In addition, the network's centralized command and control capabilities will enable LAFD to deploy resources, track personnel, and maintain communication security more efficiently and effectively.

2.2 PROPOSED SYSTEM ARCHITECTURE

The proposed ASTRO 25 solution will provide an adaptable and affordable platform for mission critical wireless communications throughout LAFD's geographic area. The proposed system consists of a primary zone core that comprises the master site and Radio Frequency (RF) sites referred to as the "system" throughout this proposal.

The proposed solution consists of the following sites:

- One fully redundant master site.
- Simulcast prime site.
- Nine 20-channel simulcast remote sites.

The "master site"—where core equipment is located—provides a central point of control for the operation of the radio communication system. From the master site, LAFD's system administrators will have access to the hardware and software components that control call processing, network management, and system

configuration. Common Server Architecture (CSA) reduces physical space and individual component requirements at the master site by using Virtual Management Servers (VMSs) to host server applications in a Virtual Machine (VM) environment.

The proposed Simulcast Sites provide simultaneous broadcast of the same voice or message from multiple transmitters on the same frequency. Simulcast sites provide consistent communications throughout large geographical areas, such as a large city, metropolitan area, county, or country. The architecture of a simulcast cell includes a simulcast prime site, which controls the cell and communicates with the system's master site, and one or more simulcast remote sites, which provide simulcast coverage to users.

2.3 SYSTEM CONFIGURATION MANAGEMENT

The ASTRO 25 system will provide LAFD's system administrators with a centralized approach to configuring the proposed system.

With the Unified Network Configurator (UNC), LAFD's system administrators will be able to configure networks and devices in the ASTRO 25 system through easy editing screens and configuration "wizards." Role-based radio user setup, auto discovery of devices/configurations, and minimized data entry reduces configuration errors and initial configuration time. Personnel can quickly access historical configuration and forensic information, and quickly roll back to previous configuration versions, if necessary.

The UNC can direct comparison between the current system configuration with any planned changes, simultaneously displaying the configurations and enabling the scheduling of any changes for distribution during off hours, minimizing the impact of system changes on communications. The UNC is highly secure, supporting SSH and SNMP passwords and providing an automated mechanism to seamlessly roll passwords and passphrases.

The Provisioning Manager (PM) enables LAFD's system administrators to provision the infrastructure and devices in the ASTRO 25 radio system through a GUI. The PM offers a well-rounded set of features:

- **Streamlined Web-Based Graphic User Interface –** Requires fewer keystrokes to manage critical information. Provides a central point for the configuration of operational parameters for mobile and portable radios, dispatch operator positions, and system administrators.
- **Batch Creation of Radios –** Minimizes data entry and reuses configuration information through "Multi-Instance Creation."
- **External Provisioning Manager Interface –** Provides an interface that partners with an identified third-party vendor (Genesis, MCM, Premier One, NGI) to provide an integrated solution for critical customer applications on the system, such as, Asset Management, Billing, and Fleet Mapping applications.
- **Radio and Radio User fields Combined into One Window –** Provides efficient management of user radio provisioning by eliminating the need to enter device information multiple times.
- **Import/Export Capabilities –** Offer a convenient mechanism to export and import data from external applications using .csv protocol.

With the PM's integrated database, system administrators are required to enter data only once, improving accuracy, saving time, and maintaining data integrity.

2.4 SYSTEM PERFORMANCE MANAGEMENT

The ASTRO 25 performance suite will enable LAFD's system administrators to monitor, manage, and report on system performance in near real-time, as well as proactively plan for expansion. The performance suite comprises both Motorola Solutions and third-party management applications that are

certified, integrated, and supported by Motorola Solutions. Together, these applications provide a complete picture of how the system is operating.

The Computer Aided Dispatch Interface (CADI) provides an Application Programming Interface (API) that enables the connection of the ASTRO 25 radio system with third-party CAD applications. Through CADI LAFD will be able to work with third-party vendors to create software that specifically meets LAFD's CAD needs on Motorola Solutions ASTRO 25 radio systems. The API gives the CADI client application direct access to the commands and events used by LAFD's system and its network management applications. Motorola has included 40 hours of API technical support. Additional support can be purchased if needed.

2.5 SYSTEM FAULT MANAGEMENT

System performance depends on the proper functioning of the system's software and components. The proposed system includes the following features to facilitate the detection, isolation, and resolution of events that are reported by system components.

The Unified Event Manager (UEM) provides critical fault management, including processing and presentation of events that are sent by managed devices. Historical and real-time traffic screens will give LAFD's system administrators access to radio events, radio status, and any device alarms.

The UEM supports the following main functions:

- **Device discovery –** The UEM is optimized to quickly discover the managed devices in the system.
- **Fault management –** Fault management in the UEM includes processing and presentation of events sent by a managed device.
- **Supervision –** The UEM periodically checks its ability to communicate with the devices it manages.
- **Synchronization –** The UEM performs synchronization automatically, by validating the health of a device with the information stored in the fault management database.
- **North Bound Interface –** The included NBI allows UEM to send SNMP alarms "North" to a 3rd party fault management system. While Motorola has included the interface it a City responsibility to manage integration to a 3rd party, such as WhatsUp.

The UEM will provide secure communications with LAFD's managed devices. If a loss of communication with a managed device occurs, that failure will be reported to the UEM, which will alert administrators according to the severity of the event. The UEM's alarm view dynamically updates based on the condition of the reported device (that is, the alarm will be cleared from the alarm view when a device sends a clear event to the UEM).

The UEM is the system's main fault manager, aggregating all system health information and managing the status of non-Motorola Solutions equipment through SDM3000 Remote Terminal Units (RTUs). Devices from other manufacturers managed by the UEM include power and security equipment, microwave radios, and environmental alarms for doors, and control tower lights.

UEM Enhanced Navigation enables advanced navigation and data visualization capabilities in the UEM client. The user can navigate through zone and system health information using a drill-down navigation concept, traversing through additional views and visualizing data related to infrastructure health. The enhance navigation enables the following features:

- System Map.
- Site View.
- Network Element View.
- Visualization of RTU Digital Input/Digital Output/Analog Input information.

- Advanced drill-down navigation.

The UEM Simple Network Management Protocol (SNMP) Element Management Toolkit enables third-party vendors to define SNMP messages between their devices and the UEM, allowing system administrators to monitor faults on critical third-party devices directly from the UEM.

UEM Email Alarm Notifications will allow LAFD's system administrators to configure e-mail notifications for events and alarms in the Unified Event Manager (UEM) application. Alarm notifications can also be forwarded to a mobile device such as a cell phone or personal digital assistant (PDA).

North Bound Interface (NBI) describes an interface offered by many Network Management System (NMS) products, such as Unified Event Manager (UEM), which allows for NMS features, functions, and data to be accessible for Operations Support System (OSS) and Manager of Managers (MoM). NBI uses SNMPv3 and the User-Based Security Model (USM) to provide secure communication between the UEM and NMS. NBI offers the following services:

- **NBI Event Forwarding –** The events reported on the UEM are sent to registered NMS products using SNMPv3 traps.
- **NBI Notification Persistence –** The UEM stores the last 300 forwarded events to enable the NMS to quickly retrieve any events it may have missed.
- **NBI Event Synchronization –** The UEM provides the means for the NMS to query and obtain a set of events from the UEM datastore. This feature is typically used to obtain events missed due to lost traps or when connectivity between the UEM and NMS is lost temporarily.
- **Getting QuickSync events –** The UEM provides the means for the NMS to query and obtain a set of events from the UEM datastore. This feature is typically used when the missed trap is within the most recent 300 traps captured in the NMS.
- **NBI Alarm Synchronization –** The UEM provides the means for the NMS to query and obtain a set of alarms from the UEM datastore. This feature is typically used to re-synchronize fault information on the NMS after an extended outage.

2.6 CORE SYSTEM COMPONENTS

An ASTRO 25 radio system is comprised of a master site and one or more radio frequency sites. This section provides descriptions of the components at each location.

2.6.1 Master Site Core Components

The equipment at an ASTRO 25 master site provides an adaptable and affordable platform for mission critical wireless communications in a scalable and virtualized configuration. The master site equipment comprises the system's core components, including a common server architecture (running the applications that provide command and control for the system) and LAN switches (routing information to and from the master site to the radio frequency sites that provide system coverage). The master site will be located at MFC.

2.6.1.1 Common Server Architecture

A master site's Common Server Architecture (CSA) deploys server applications with the Linux/Windows operating systems on a HP DL380 Virtual Management Server (VMS) host. The VMS hosts the following server applications through VMware in a Virtual Machine (VM) environment:

- **Air Traffic Router (ATR) –** Captures data exhibited by Affiliation Display, Dynamic Reports, Historical Reports, Radio Control Manager (RCM) Reports, and for systems with the Inter-RF System

Gateway (ISGW) employing the ISSI 8000/CSSI 8000 feature. The ATR also captures foreign talkgroup and foreign Subscriber Unit Identifier information for ZoneWatch to display.

- **Backup and Recovery (BAR) Server –** Backs up and restores critical data.
- **Core Security Management Server (CSMS) –** Provides antivirus service and multi-factor authentication.
- **User Configuration Server (UCS) –** Stores information about user radios, talkgroups, critical sites, and security information.
- **Zone Database Server (ZDS) –** Exports infrastructure and subscriber information it receives from the User Configuration Server (UCS) to consoles and site gateways (conventional channel interface).
- **Zone Statistics Server (ZSS) –** Provides database storage of statistics and back-end processes required for zone-level functions.
- **Zone Controller (ZC) –** Provides centralized control for call processing and mobility management functions.
- **License Manager –** Stores and manages software licenses.
- **Unified Event Manager (UEM) –** Provides fault management.
- **Unified Network Configurator (UNC) –** Provides controlled and validated configuration management of system devices.
- **Authentication Center (AuC) Server –** Provides key management function in the system and stores authentication keys.
- **Centralized Event Logging Server (Syslog) Server –** Captures Operating System (OS) events generated by most devices in the Radio Network.
- **Unified Network Configurator (UNC) Device Server (UNCDS) –** Enables the UNC to manage up to 15,000 devices.
- **System Statistics Server (SSS)** – Stores and provides statistical data for the system.
- **vCenter Appliance** – Manages all fault tolerant Packet Data Gateways (PDGs) and ATRs.
- **Network Management (NM) Client** – Provides a virtual workstation for system administrators and technicians to use for various system-related tasks.
- **Intersystem Gateway (ISGW)** – Supports an ISSI interface and a CSSI interface for interconnectivity with P25 compatible systems and consoles.

2.6.1.2 Firewall

A firewall provides network boundary enforcement and attack detection features. The firewall restricts traffic to known sources, destinations, and protocols, based on the hosts and services that are specified in the firewall configuration. All undefined traffic is discarded.

2.6.1.3 LAN Switches

The master site includes one or more LAN switches. The LAN switches aggregate all the Ethernet interfaces for all servers, clients, and routers at the core.

The proposed system for LAFD will include redundant LAN switches for added system resilience.

2.7 800MHZ ANALOG VRS RADIO SYSTEM

Motorola Solutions has included upgrading LAFD's existing 18 voter / comparators with the GRV 8000 Analog Simulcast Comparator. This proposal includes upgrading the existing 150 remote site transmitters with the GTR 8000 Base Radio (Transmitter). In addition to the 150 transmitter upgrades an additional 12 transmitters have been included to complete the build out of all 18 simulcast channels at each of the 9 transmitter site locations.

Motorola has included 18 additional transmitters to add two (2) new channels to the LAFD simulcast radio system. Frequency licensing and coordination is not included in the proposal and is the responsibility of LAFD and/or ITA.

To ensure that each component of the system is properly configured, and supported Motorola has included replacement of the RF distribution sub-systems at each of the transmitter site locations. This includes the 800MHz combiners, transmission line, and antennas at each of the 9 sites.

Figure 2-1: LAFD Transmitter Site Locations

2.7.1 Radio Frequency Site Component Descriptions

An ASTRO 25 Radio Frequency (RF) site supports a wide variety of configurations to meet critical communications requirements for present and future communication needs. Depending on the RF site configuration, each RF site has several different components. The following components are included in the RF sites provided as part of our solution for LAFD.

2.7.1.1 GTR 8000 Site Repeater/Base Radio

The GTR 8000 base radio consists of a transceiver module, power amplifier module, fan module, and power supply. The transceiver module includes the functionality for the exciter, receiver, and station control. The base radio software, configuration, and network management, as well as inbound/outbound traffic handling, are performed through this transceiver module. On–board serial and Ethernet ports are located on this module for local servicing through Configuration/Service Software (CSS). The power

amplifier module amplifies the low–level modulated RF signal from the transceiver module and delivers the amplified signal on the path to the transmit antenna. The power supply module supports the transceiver and power amplifier modules and can also provide auxiliary power to a connected site controller or receive multicoupler/low noise amplifier

Figure 2-2: G–Series Chassis—A single chassis and six basic modules create the entire G–series platform, resulting in reduced spare parts inventory.

2.7.1.2 GRV 8000 Conventional Comparator

The GRV 8000 Comparator is used in Project 25 (P25) conventional or P25 trunking voting and simulcast network topologies to increase the talk-in coverage of a radio in the field.

The comparator works by picking up the audio from multiple sites and performing a frame-by-frame analysis to identify and combine the highest quality audio package for transmission.

The GRV 8000 supports analog conventional and P25 digital conventional systems.

Features:

- Software configurable, upgradable, and convertible hardware ensures long hardware lifespan
- Software-only installations can enable new features
- Remote system software upgrades and patching includes system release migration and security updates
- Easy to service - only front access is required and modules are hot-swap capable
- Two comparator modules per chassis means comparators are smaller than ever
- Daisy-chainable power supplies among comparator chassis ensures seamless operation
- AC/DC -48V power supplies with integrated battery revert and charging enables elimination of UPS installations in many site designs
- Chassis is 3 RU
- Size: 5.25" x 19" x 18"

Figure 2-3: GRV 8000 Conventional Comparator

2.7.1.2.1 GRV 8000 / GTR 8000 interconnect Diagram

The diagram below depicts the high-level operation of the GRV 8000 Comparator with the GTR 8000 Base Radios. Include in the graphic is a depiction of the optional Analog Sidetalk feature.

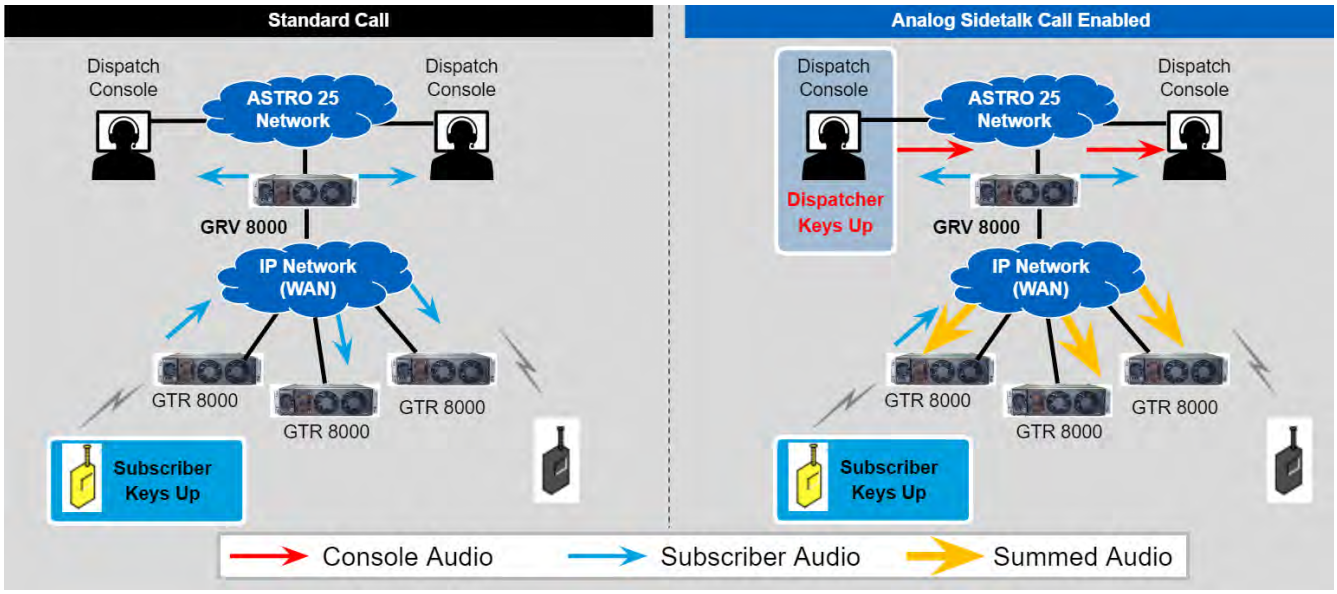


Figure 2-4: GRV/GTR Audio Process w. Analog Sidetalk

2.7.1.3 TRAK 8835 Site Reference

The TRAK 8835 Site Reference is a GPS–based frequency and time reference. The TRAK 8835 Site Reference device is certified only for use at an ASTRO 25 repeater site and circuit–based or IP–based analog–only voting subsystems.

Figure 2-5: TRAK 8835 Site GPS Reference

2.7.1.4 Site LAN Switch

The site LAN switch provides a LAN interface for site equipment and a LAN port for the site gateway. Through the switch, the service technicians gain access to service the site, and access to the system's Graphical User Interface (GUI).

Figure 2-6: Aruba 2930F LAN Switch

2.7.1.5 Site Router/Firewall

Motorola Solutions includes two site Router/Firewalls at each remote site for redundancy and enhanced security. The SRX345 features customizations designed to optimize the performance of Mission Critical radio traffic.

Figure 2-7: Juniper SRX345

2.7.1.6 RFDS (Combiner & Antenna) Replacement

Each of the nine (9) RF sites includes a one-for-one replacement of the existing combiner, transmit antenna, receive antenna, RF transmission line, and TTA. The equipment cannot co-exist on the towers and will require a detailed cut-over plan that will be finalized during the contract design review stage.

Table 2-1: Site Antenna Parameters

Site Name	Transmit Antenna	Receive Antenna
100 Wilshire	DS7C08PPYU-D_840_0_REV3	DS7C09P36U-D_816_0_Rev2
Baldwin Hills	DS7C08PPYU2D_815_2	DS7C09P36U-D_816_0_Rev2
Beverly Glenn	CC807-08 @806 V1.0	DS7C09P36U-D_816_0_Rev2
KSKQ Radio	DS7C08PPYU-D_840_0_REV3	DS7C09P36U-D_816_0_Rev2
Los Angeles City Hall	DS7C06P36T-D_BOTTOM_Rev2	DS7C06P36T-D_TOP_Rev2
Mount Washington	DS7C08PPYU-D_840_0_REV3	DS7C09P36U-D_816_0_Rev2
Oat Mountain	DS7C08PPYU-D_840_0_REV3	DS7C09P36U-D_816_0_Rev2
San Pedro Hill	DS7C08PPYU4D_815_4	DS7C09P36U-D_816_0_Rev2
Verdugo Peak	DS7C09P36U-D_816_0_Rev2	DS7C09P36U-D_816_0_Rev2

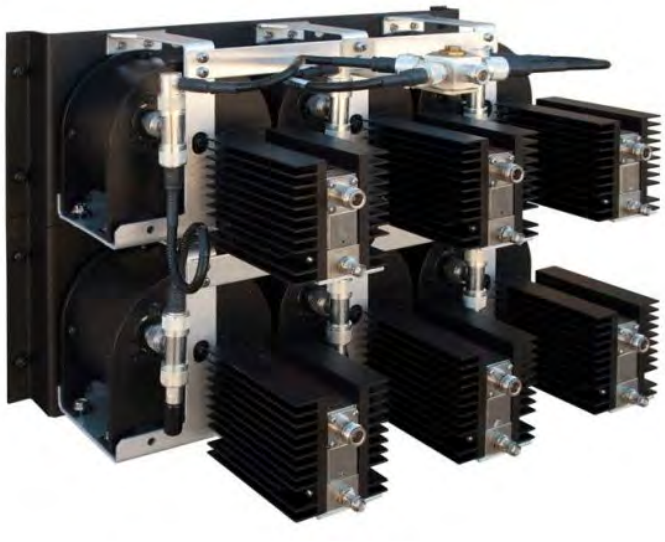


Figure 2-8: Custom dbSpectra Combiner

Figure 2-9: Omni-Directional 7/800MHz Antenna

Figure 2-10: Slim Panel Directional Antenna

Figure 2-11: RFI Tower-Top Amplifier

2.7.1.7 Site Loading (Power, Space, & Weight)

At all existing transmitter sites, assuming no changes to the transmit power or currently licenses ERP's, the new equipment will not consume more utility power, require more tower space, or require more shelter space than the old equipment being removed. In situations where the proposed solution would increase the overall load, in any category, Motorola will down-scope the design to fit the existing loading profile. For example, the DC systems are designed for the requested 8-hour run-time with 12-hour recharge. However, if the DC system being replaced does not currently meet those specifications and there is not enough capacity for expansion, the new DC system at that specific location will be reconfigured to match the old

system one-for-one. Despite the addition of channels are many of the sites, due to the improved efficiency of the GTR radios, and optimization of the RF Distribution System, the overall utility draw is not anticipated to increase. All of this assumes, except for the new channels, that the new transmitters will be configured to the same operating levels of the existing transmitters.

Civil improvements at the transmitter sites are not included. If site issues exist today, they will not be remediated in this project. The net result of this project will not cause any net-new Civil issues, specifically, utility power requirements, tower loading, shelter loading, and rack space. This is only applicable to the nine (9) existing transmitter sites. As requested by the City, Motorola has included tower Mapping and Loading studies for each tower location with the exception of 100 Wilshire and City Hall.

2.8 PRELIMINARY CUTOVER PLAN

Motorola realizes the transition from LAFD's existing system to an upgraded system is not to be taken lightly. We recognize the importance of a well thought out transition plan and therefore, we dedicate considerable planning and resources to make the transition as smooth and graceful as possible, considering operation, technical and logistical considerations.

This section represents a preliminary plan to outline the steps required in the cut-over process from the existing system to the new system. A detailed plan will be created during the detailed design review (DDR) phase, utilizing the precise site and equipment detail available at that time, and working with LAFD to identify times and dates for specific steps to minimize any potential downtime or other impacts to operations. Note that by the DDR, the two new system frequencies will have been identified and acquired.

Motorola has included a preliminary install and transition plan based on the following phases:

- RF Infrastructure Cut-Over
  - Phase 1 – Sites Preparation / Baseline Coverage Verification
  - Phase 2 – Antenna/RFDS System & DC Power Replacement
  - Phase 3 – Antenna/RFDS Coverage Verification
  - Phase 4 – Pilot Channel Removal / Install
  - Phase 5 – Guaranteed Coverage Test
  - Phase 6 – Remaining Channels Removal / Install
- Dispatch Console Cut-Over
  - Phase 1 – OCD Dispatch Center Installation
  - Phase 2 – MFC Dispatch Center Installation

This plan will allow LAFD and its users to fully understand what will occur and when events will occur during the transition. The cutover plan will be reviewed and updated again after Design Review and prior to cutover to ensure it meets the needs of the LAFD and the City.

2.8.1 RF Infrastructure Cut-Over

2.8.1.1 Phase 1 – Sites Preparation / Baseline Coverage Verification

Motorola has included a baseline coverage verification of the existing system today. Before any RF site work is completed Motorola will conduct a subjective audio test on the existing system and present LAFD with the results. This test will be limited to paved roads within the boundaries of the City of Los Angeles. More details of this Baseline Test are available in the Statement of Work section.

2.8.1.2 Phase 2 – Antenna/RFDS System & DC Power Replacement

After completion of the baseline coverage verification Motorola will replace the existing DC system, RFDS, and antennas at the nine remote sites. The existing transmitters and voters will continue to operate on the new DC, RFDS, and Antenna system. This step will take sites offline as the DC system and antennas are replaced. Motorola will work with LAFD and the City to limit the impact to operations.

2.8.1.3 Phase 3 – Antenna/RFDS Coverage Verification

After installation and optimization of the new Antennas and RFDS, Motorola will conduct another Baseline Coverage Verification. This test will be limited to paved roads within the boundaries of the City of Los Angeles. More details of this Baseline Test are available in the Statement of Work section.

2.8.1.4 Phase 4 – Pilot Channel Removal / Install

Upon completion of the second Coverage Verification Motorola and its Subcontractors will install the Motorola Routing equipment and configure the existing Cisco MPLS routers in preparation for the new IP Based Voters and Transmitters. Upon completion, one existing RF channel will be taken offline, equipment removed, and replaced with the new G-Series based Voter and Transmitter equipment. This channel will be out of service until the completion of the Guaranteed Coverage Test.

2.8.1.5 Phase 5 – Guaranteed Coverage Test

Once the pilot channel is installed and optimized Motorola will conduct the official, guaranteed, coverage test against the as-built coverage map, grid file, and final CATP.

2.8.1.6 Phase 6 – Remaining Channels Removal / Install

Once the CATP is complete and coverage is verified Motorola will start removing and replacing the remaining RF channels in a multi-mobilization approach.

- 1st Mobilization: New Channels 19 & 20, and Existing Channels 2 & 3
- 2nd Mobilization: Existing Channels 4,5, & 6
- 3rd Mobilization: Existing Channels 7, 8, 9, & 10
- 4th Mobilization: Existing Channels 11, 12, 13, & 14
- 5th Mobilization: Existing Channels 15, 16, 17, & 18

During each mobilization the respective channels will be brought offline during the removal, installation, and cut-over period.

2.8.2 Dispatch Console Cut-Over

2.8.2.1 Phase 0 – Existing MFC Consoles

As the radio system is progressively cut-over Motorola will provide an Analog audio port to allow the new Voter/Transmitter system audio to be present on the existing MFC consoles prior to AXS cut-over. The demarcation for this port will be in the same rack as the current analog-to-IP equipment located at City Hall East. Motorola will need the support of LAFD/ITA with configuration changes on the existing consoles.

2.8.2.2 Phase 1 – OCD Dispatch Center Installation

Motorola Solutions will use the OCD dispatch center as the pilot for the AXS Dispatch Console Platform. Motorola will bring the entire OCD dispatch center offline and install all consoles and dispatch center components. Upon completion and acceptance of the Field Acceptance Test Motorola will begin transitioning the MFC dispatch center.

2.8.2.3 Phase 2 – MFC Dispatch Center Installation

At the MFC dispatch center Motorola will first remove and install new consoles at the non-critical dispatch positions located throughout the building. After installation and testing of the non-critical positions the main dispatch floor transition will begin. The dispatch floor will be broken into three segments and cut-over will occur in succession at these segments.

2.9 TECHNICAL TRAINING

Motorola has included a training bankf in this project for up to 12 technicians for each sub-system (RF Infrastructure, AXS Consoles, and Verint Logging) and 20 AXS Dispatch Users. Dispatch training is based upon a “train-the-trainer” model. Below are links to the currently available courses as well as a pricing schedule.

2022 Training Catalog:
https://learning.motorolasolutions.com/node/27012/download

2022 Training Pricing Schedule:
https://learning.motorolasolutions.com/node/34620/download

SECTION 3

DC POWER UPGRADES & TOWER STUDIES

3.1 DC POWER SUB-SYSTEM REPLACEMENTS

Motorola is providing new 48VDC power systems for all LAFD Prime and Remote RF sites (1 prime, 9 remote). Each new site will be equipped with the ELTEK Flatpack2 -48V power systems. Each remote site will feature eight (8) 48V, 3000W Flatpack2 inverters contained in a single, redundant, chassis. Each site will include two 48VDC to 120VAC power inverters. This will allow an AC only equipment to benefit from the DC power sub-system.

3.1.1 Remote Site DC Power Components

Each site will contain the following high-level equipment

- One (1) ELTEK Flatpack2 Rectifier Shelf
- Eight (8) 3000W, 48V Flatpack2 Rectifiers
- Two (2) 48VDC to 120VAC Power Inverters
- One (1) Seismic Battery Rack
- One (1) 48V 1200AH Battery Set 3W x 8H
- One (1) DC System Power Panel

3.1.2 Prime Site DC Power Components

Each site will contain the following high-level equipment

- One (1) ELTEK Flatpack2 Rectifier Shelf
- Three (4) 3000W, 48V Flatpack2 Rectifiers
- Two (2) 48VDC to 120VAC Power Inverters
- One (1) Seismic Battery Rack
- Two (2) Battery Sets 48V/170AH 12V170FS
- One (1) DC System Power Panel

3.1.3 Major Components

3.1.3.1 Flatpack2 Rectifier

The Flatpack2 HE family is available in a variety of voltages and power ratings, all with superior efficiency up to 96.5%. With more than 4 billion in-field operating hours and a proven cumulative field MTBF of more than 1.9 million hours, Flatpack 2 HE is the only HE (High Efficiency) rectifier with a proven track record. The line of systems available for the ENERGY STAR® qualified Flatpack2 HE 48V

rectifiers spans from 8kW 2U racks with complete distribution to multi-cabinet systems in multi MW installations.

Figure 3-1: Flatpack2 Rectifier

3.1.3.2 Trilogy with SmartpakS

At only 16 to 19 deep, the Trilogy system is designed for use in rack spaces and cabinets. Both 19 and 23 rack widths are available.Powered by Flatpack2 HE rectifier modules, typical efficiency exceeds 95% at 48VDC output. Flatpack2 DC/DC converters can also be added within the same system footprint.

The distribution sections features unique circuit breaker holders that facilitate at-will assignment in the field to one of two output buses. Bulk cable connections are available in the rear of the distribution. All cabling is vertical, further reducing horizontal space demands.

Figure 3-2: Smartpack2 Rectifier Chassis

3.1.3.3 EnerSys Battery Set

EnerSys PowerSafe 12V125F range of valve regulated lead acid batteries have been designed specifically for use in applications which demand the highest levels of security and reliability. They have a long service life and an excellent high rate of performance.

PowerSafe V batteries deliver superior performance while occupying less space than conventional standby power batteries. The use of V-0 rated, flame retardant, ABS plastic for the thick wall containers and covers offers high mechanical strength with excellent safety features. Oxygen evolved at the positive plates diffuses through microporous separators to the negative plates and, by a series of chemical reactions within the cell, recombines to form water. Each cell incorporates its own safety valve that allows the controlled release of gas when pressure builds up within the cell.

EnerSys PowerSafe 12V125F Specifications

- 6 Cell, 12V
- 125Ah
- 22.1L x 4.1W x 12.4H

Figure 3-3: EnerSys PowerSage Batteries

3.1.4 Breaker Requirements

Below is a listing of suggested breaker sizes and counts to support the proposed DC system designed to support all twenty (20) channels at each of the nine (9) sites and prime site. The proposed DC system will replace the existing DC system and the two will not need to co-exist. In the event the recommended amount of breaker space and utility power is not available at a site then the DC system, for that site, will be downsized to match the existing footprint. If the downsizing is significant enough to prevent the expansion channels from operating then the expansion channels will be disabled until adequate power can be provided.

3.1.4.1 Prime Site Locations

Option A	Option B
Two (2) – 120V, 15A Circuits	Two (2) – 120V, 15A Circuits
Four (4) – 240V (or 208V), 30A Circuits	Two (2) – 240V (or 208V), 50A Circuits

3.1.4.2 Remote Site Locations

Option A	Option B
Two (2) – 120V, 15A Circuits	Two (2) – 120V, 15A Circuits
Eight (8) – 240V (or 208V), 30A Circuits	Four (4) – 240V (or 208V), 50A Circuits

3.1.5 Power Failure

Motorola's has provided a design to ensure the voter system is as fault tolerant as possible. Each transmitter will feature an independent DC breaker. In the event of a breaker is tripped the impact will be limited to only that single transmitter (channel) at that particular site.

3.2 TOWER LOADING STUDIES

This project is intended to replace tower equipment on a one-for-one basis, with no point of old and new equipment co-existence on the tower. However, to validate this assumption, tower loading studies have been included for each of the remote transmitter sites, excluding 100 Wilshire and LA City Hall. Rectifying any discovered issues are not included in this proposal and are the responsibility of LAFD and/or ITA.

SECTION 4

COMMANDCENTRAL AXS DISPATCH CONSOLES

Motorola has included our CommandCentral AXS Dispatch Console in this proposal to provide LAFD with the confidence of state-of-the-art secure communications, seamless IP-based connectivity, flexible system architecture with scalable components, and centralized console management.

Motorola Solutions designs its console to help reduce the total cost of owning an IP-based, feature-rich dispatch system without compromising quality and reliability. The console provides LAFD with sophisticated network management and easy migration to future capabilities.

4.1 DISPATCH CONSOLE CONFIGURATION FOR LAFD

The proposed console will interface with the City of LA's ASTRO® 25 system via an ISSI connection. This will allow LAPD and LAFD to operate completely independent systems while simultaneously maximizing interoperability options. Allowing dispatchers to transmit, receive, patch, etc. on both the LAFD and LAPD channels.

The proposed solution offers LAFD seventy-two (72) dispatch console positions at MFC and twenty-eight (28) at OCD.

4.2 AXS DISPATCH OVERVIEW

Motorola Solutions' CommandCentral AXS Dispatch Console reduces the barriers between systems in LAFD's dispatch center, allowing access to all the mission-critical tools and applications dispatchers need in the moments that matter. CommandCentral AXS integrates the capabilities of other dispatch center technologies into a single, streamlined view. This makes operation more efficient in emergency situations. Resources are accessible with an intuitive, highly configurable browser-based GUI. Dispatchers will have an expansive feature set, a mission-critical IP network for transporting information and calls throughout the system, and robust integration capabilities with other dispatch center technologies.

Figure 4-1: One Screen, All the Resources Users Need

CommandCentral AXS improves the efficiency and operation of dispatchers in the following ways:

- **Next Generation Dispatch Experience —**Responds to touch, type, or click, giving dispatchers the flexibility to interact and stay connected to teams in the way that best suits them. Extensive customization options, flexible deployment configurations, and simple scalability means agencies only pay for what is needed now, with the room to adapt and grow as needs change over time.
- **Seamless Multi-system Access —**Supports future advancements and integrations with additional systems now and in the future. Dispatchers will be able to seamlessly communicate and connect across ASTRO 25 and other P25 trunking systems.
- **Pain-Free Enhancements —**Simplifies keeping up-to-date with new features, fixes, and security updates via Internet download (with valid subscription). Based on permissions from system administrators, users may trigger the download themselves without disrupting console operation. This flexible approach to updates reflects the software focus of CommandCentral AXS, and allows the update process to work around differing schedules.
- **Purpose-built Dispatch Console Accessories —**Enhances the dispatch experience with accessories, such as gooseneck microphone, speakers, headset jack, and footswitch, designed and tested for industry-leading performance and reliability.

This solution also reduces operating costs and provides a smaller physical footprint in the command center without compromising on features or reliability. This combination of seamless communications, modern architecture, and advanced integration capabilities enables the CommandCentral AXS solution to scale and evolve as needs change over time.

4.3 NEXT GENERATION DISPATCH EXPERIENCE

CommandCentral AXS features a highly customizable graphical user interface (GUI) that provides quick, single-view access to important information and functionalities from different applications and systems. The browser-based GUI's versatile option panels and scalable resources allow users to organize and customize their dispatch experience and make engagement more familiar and intuitive from shift to shift. Option panels can be relocated, exposed, or hidden as needed, giving dispatchers more control of what information they see and how they interact with those resources. CommandCentral AXS also offers multiple options for routing audio to speakers and controlling volume levels.

Mapping Panel UI Snapshot

CommandCentral AXS features flexible window positioning and assist panel capabilities for quick and efficient access to services such as:

- **Activity Log —**Provides an efficient point of reference for all incoming calls into a dispatch position, showing dispatchers detailed, searchable call information (radio resource name and call time) to enable faster and more informed response.
- **Paging —**Allows users to send customizable pages on radio resources. This flexible paging feature is integrated with CommandCentral AXS for both conventional and trunked radio resources, while an external paging encoder port on the CommandCentral Hub enables third-party paging encoders to send pages on the selected radio resources. The use of .wav paging audio files allows any type of tone page to be sent by CommandCentral AXS as well as alerting warbles or even recorded messages.
- **Patch Capabilities —**Enables dispatchers to set up a communication path between two or more resources that are normally unable to communicate with each other, such as trunked resources, conventional resources, and console telephony resources.
- **Alert Tones —**Allows dispatchers to send one of fifteen user-configurable alert tones on selected radio resources. Fifteen default .wav files are provided with the dispatch position software, but any combination of these default files may be replaced with customized .wav files to meet specific needs.
- **Channel Marker —**Enables dispatchers to send a periodically repeating piece of audio on radio resources, based on a customizable .wav file to meet the specific needs.

Flexible deployment options enable the GUI to be displayed on one or more dispatch position monitors or monitors used for other command center applications, allowing side-by-side or embedded views to better fit different dispatch workflows. This also gives users immediate access to necessary dispatch console features wherever they need. These integrations are designed to evolve and meet future needs as workflows change.

4.4 DEPLOYMENT OPTIONS

CommandCentral AXS offers flexible deployment options by providing P25 compliant features and integrations with trunking, conventional, MDC 1200 conventional, and analog conventional systems. The following table addresses which features and functionalities are available across the various platforms.

Table 4-1: CommandCentral AXS Features Per Platform

P25 Trunking	P25 Conventional	MDC 1200	Analog Conventional
• PTT Calls • Talk Group Calls • Individual, Announcement, Agency Group Calls • Secure Calls • Radio Unit ID and Alias • Emergency Call and Alarm • Call Alert • Repeat On/Off • Tactical/Normal • Radio Status Display • Remote Unit Monitor	• PTT Calls • Voice Selective Calls • Secure Calls • Radio Unit ID and Alias • Emergency Call and Alarm • Call Alert • Repeat On/Off • Frequency Select • PL Select • Mute Second Receiver • Wild Card • Radio Status Request, Display • Radio Message Display • Radio Enable/Disable • Radio Check • Remote Unit Monitor	• PTT Calls • Voice Selective Calls • Secure Calls • Radio Unit ID and Alias • Emergency Call and Alarm • Call Alert • Repeat On/Off • Frequency Select • PL Select • Mute Second Receiver • Wild Card • Radio Status Request, Display • Radio Message Display • Radio Enable/Disable • Radio Check • Remote Unit Monitor	• PTT Calls • Repeat On/Off • Frequency Select • PL Select • Mute Second Receiver • Wildcard

4.5 SIMPLIFIED UPDATES

CommandCentral AXS gives LAFD personnel greater control of the software update process. Based on policies set by the system administrator, dispatchers and/or system managers can decide when updates will best fit in their workflow to minimize interruptions and ensure software is up-to-date when it is needed most. Users can access these update deployments through the Cloud Software Hub.

With Internet connectivity, users can perform the following actions:

- Download the latest CommandCentral AXS software release into the cluster via the Cloud Software Hub.
- Manage software entitlement licenses via the Motorola Licensing website.
- Access product documentation through via the Motorola Learning Solutions website.

4.6 RELIABILITY/AVAILABILITY

The CommandCentral AXS solution delivers high availability and minimized user downtime in the event of failures. The AXS console continuously monitors software processes and hardware elements and in the event of failure will rapidly restart failed software processes or launch replacement services on the remaining healthy hardware elements. More information on AXS reliability is located in the Cluster section below.

4.7 LAFD'S PROPOSED CONFIGURATION

4.7.1 Number of Dispatch Position Clients and Locations

The CommandCentral AXS dispatch position client consists of the CommandCentral Hub running on a Linux Operating System, while the GUI is displayed on the Chromium web browser. The proposed solution provides LAFD with the following dispatch position clients at the indicated locations:

Table 4-2: MFC Console Positions

Location Name	Quantity
Dispatch, Room #220	39
Training, Room #222	13
Captain Desk, Room #225	2
PSO, Room #259	1
Battalion Chief, Room #244	1
Sit-Stat Re-Stat, Room #258	2
Battalion Chief, Room #245	1
Asst. Chief, Room #249	1
Chiefs Office, Room #250	1
OCD B.C. Office	1
FCCS CAD Dev Room, Room #241	3
Tech Control, Room #214	1
Equipment Room #215	1
AV Equipment Room #221	1
AT&T Room	2

Location Name	Quantity
Captain Room #225	1
Captain Room #227	1
Total Quantity	**72**

Table 4-3: OCD Console Positions

Location Name	Quantity
Dispatch Room	23
Public Safety Officer (PSO)	1
Battalion Chief	1
Captain's Office	1
Captain's Office	1
Tech Control Maintenance	1
Total Quantity	**28**

4.7.2 Dispatch Position Client Hardware

The CommandCentral AXS dispatch console solution can be enhanced through dispatch peripherals, such as speakers, microphone, headset jack, and footswitch. These peripherals are designed for 24/7 usage without degradation in performance or reliability.

The CommandCentral AXS dispatch position features the following hardware elements:

- One (1) CommandCentral Hub
- One (1) Touchscreen Monitor
- Four (4) Speakers
- Two (2) Microphones
- Two (2) Headset jack box(s)
- One (1) Footswitch

4.7.3 CommandCentral AXS Cluster Specifications

The CommandCentral AXS servers are split into groups of three or more called clusters, and a single cluster supports the dispatch position clients at each location. All call processing, audio processing, and console software for the dispatch position clients is handled in this cluster. The cluster distributes the dispatch position client connections across the servers to provide load balancing and resiliency, while anti-malware protects the cluster against cybersecurity threats.

A configuration service for the console-specific aspects of an AXS console (such as number of speakers per dispatch client or user roles) is provided in the cluster. Configuration of radio system parameters is done in the radio system's configuration manager and is automatically downloaded into the cluster.

Each server contains six Ethernet ports, two USB ports, and a VGA port. A rack-mounted KVM (keyboard, video, mouse) switch with built-in display, keyboard, and touchpad is also available for use when installing and servicing servers.

- Server Management and Orchestration Software – Industry standard applications are used to manage the server cluster and provide high levels of availability and reliability for the processes therein.

The following cluster configuration is included at the two dispatch locations.

Table 4-4: AXS Server Cluster Configuration

	MFC	OCD
Primary Cluster Server Qty.	7	5
Redundant Cluster Server Qty.	7	5

4.7.4 Subscription Agreement

A subscription service is included as part of CommandCentral AXS to enhance dispatch capabilities over time. LAFD will be able to access CommandCentral AXS application software releases (typically released monthly) to enable new features and defect fixes. Some of the new features may require additional licensing.

The subscription also includes access to security patches (typically released monthly, but can be released more often if necessary). These patches cover all the console system software, including the operating system software, server management and orchestration software, web browser software, console application software, and other supporting software. Remote technical support is available via the System Support Center. The SSC will assist in troubleshooting and resolving any issues that may arise.

SECTION 5

LOGGING RECORDER

Motorola Solutions has partnered with Verint Systems to provide the Los Angeles Fire Department with a customized Radio and Telephony Recording solution. The following sections describe the proposed solution.

5.1 VERINT SOLUTION OVERVIEW

The Requirements of this new system have been set forth are to provide a new logging recorder that will record all audio at MFC 500 East Temple and with a Primary recorder and redundant recorder at the City Hall East OCD with the following requirements per recorder:

500 East Temple (MFC)

- Verint Primary Recorder (MFC)
  - 72 Position Select Radio Recording
  - 72 Position Phone Recording, contact closure recording.
  - 120 Talk Groups – VIA AIS Interface
  - 20 TAC Channels (Vox Analog)
  - 20 STR Channels (Vox Analog)
  - 20 Mutual Aid Channels (Vox Analog)
  - 47 E911 CAMA Trunks (Analog)
  - 3 Crash Phone (Analog)
  - 15 Nortel IP Phones
- Redundant Recorder with Expansion Chassis
  - 72 Position Select Radio Recording
  - 72 Position Phone Recording, contact closure recording.
  - 20 TAC Channels (Vox Analog)
  - 20 STR Channels (Vox Analog)
  - 20 Mutual Aid Channels (Vox Analog)
  - 47 E911 CAMA Trunks (Analog)
  - 3 Crash Phone (Analog)
  - 15 Nortel IP Phones
- Quality Management
  - 120 Named Users
  - 6 Evaluators
  - Online Training for 6 Evaluators
- CAD Integration
  - Integrate CAD Data with E911 Telephone Calls, Custom Integration to pull CAD Fields

City Hall East (OCD)

- Verint Primary Recorder (OCD)
  - 28 Position Select Radio Recording
  - 28 Position Phone Recording, contact closure recording.
  - 120 Talk Groups – VIA AIS Interface
  - 20 TAC Channels (Vox Analog)
  - 20 STR Channels (Vox Analog)

  - 20 Mutual Aid Channels (Vox Analog)
  - 47 E911 CAMA Trunks (Analog)
  - 3 Crash Phone (Analog)
  - 15 Nortel IP Phones
- Verint Secondary Recorder (OCD)
  - 28 Position Select Radio Recording
  - 28 Position Phone Recording, contact closure recording.
  - 20 TAC Channels (Vox Analog)
  - 20 STR Channels (Vox Analog)
  - 20 Mutual Aid Channels (Vox Analog)
  - 47 E911 CAMA Trunks (Analog)
  - 3 Crash Phone (Analog)
  - 15 Nortel IP Phones

The Verint Solution Design is based upon the LAFD Logging Recorder Requirements Matrix dated August 7th 2021 and has been included in the Section 19 “LAFD Logging Recorder Requirements Matrix” of this proposal.

5.2 VERINT RECORDING SOLUTION DESIGN

5.2.1 Telephone & Radio Recording

To meet these requirements set forth by LA Fire, Motorola and Verint Systems is proposing a Public Safety Recording Solution based upon the Verint Recorder v15.2.

To accomplish the recording requirements for the LA Fire Communication Center, Verint will deploy Primary recorder and a Redundant recorder at MFC and Primary and Redundant Recorder the OCD location. Each Server and Recorder server will capture the following communications:

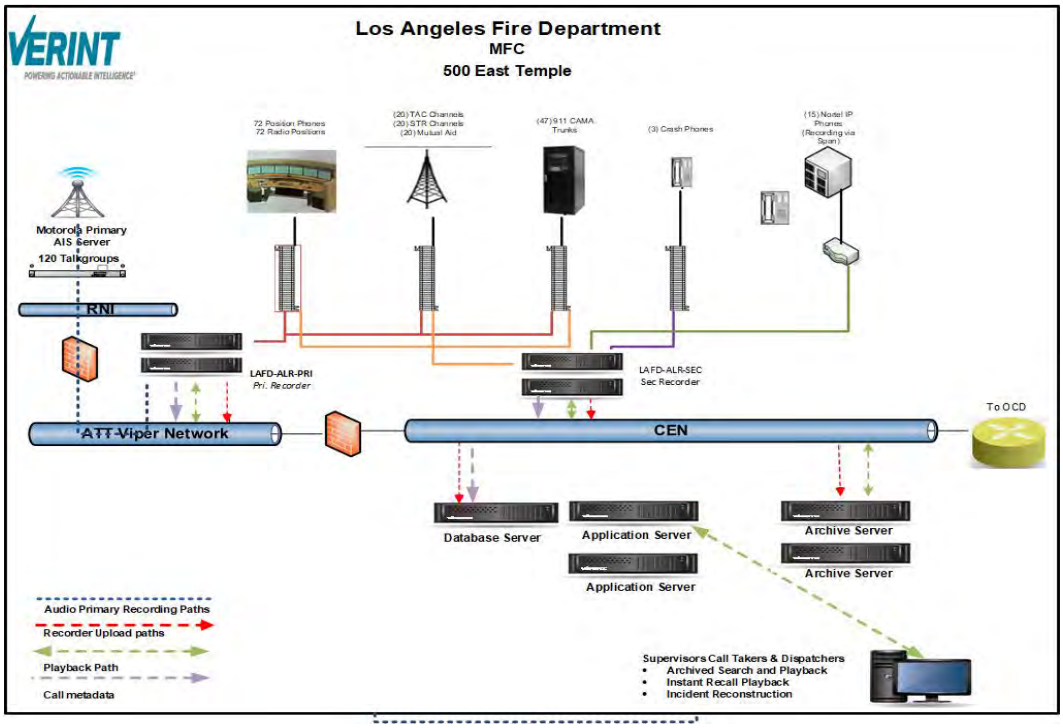


Figure 5-1: MFC Location

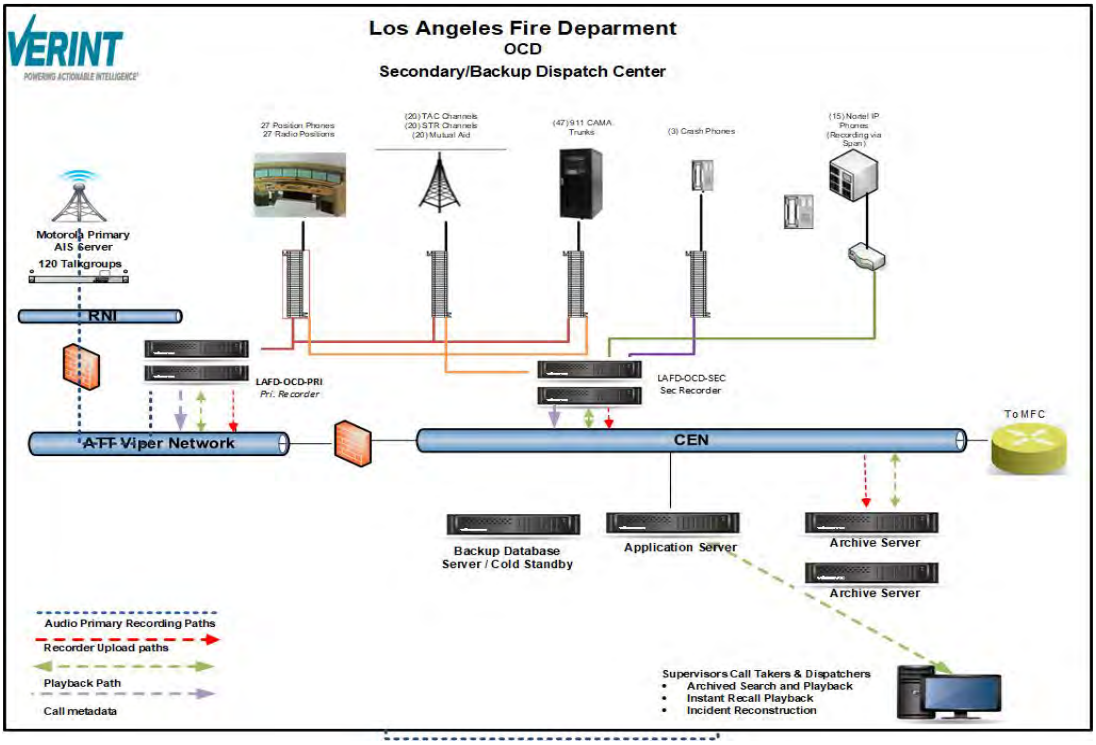


Figure 5-2: OCD Location

5.2.1.1 MFC Location

- Data Base Server
  - Verint Database services for MFC will be the Primary DataBase, the Secondary DataBase will reside at OCD
- Application Servers (2)
  - Servers that will distribute the users access for playback and application access.
- Primary Recording Server
  - 389 channels Radio & Telephony inputs
  - Provide 3.8TB of local Storage
- Redundant Recording Server
  - 389 channels Radio & Telephony inputs
  - Provide 3.8TB of local Storage
- Archive Servers
  - Provide 3.8TB of Archive Storage

5.2.1.2 OCD Location

- Data Base Server
  - The Secondary DataBase will reside at OCD, the Primary will be at MFC Location
- Application Server (1)
  - Servers that will distribute the users access for playback and application access.
- Primary Recording Server –
  - 299 channels Radio & Telephony inputs
  - Provide 3.8TB of local Storage
- Redundant Recording Server –
  - 299 channels Radio & Telephony inputs
  - Provide 3.8TB of local Storage
- Archive Servers –
  - Provide 3.8TB of Archive Storage

5.2.1.3 Customer Services to Extract CAD Data

The Verint API will be used to extract 21 fields form the LA Fire CAD system and insert this data into the Verint system to be used to query calla based on this data. All data required must be available through Verint API / Interface. Motorola/Verint will not provide any calculations or calculated fields

Below are the fields that we have discussed that would need to be captured:

1.	INCIDENT_NBR	YYYYMMDDxxxx (Example: 201401010011)
2.	INITIAL_911_TIME	timestamp
3.	CREATION_TIME	timestamp
4.	WRS_TIME	timestamp
5.	EMS_DETAIL_DESC	TDS determinant descriptor
6.	CALL_TAKER_ID	123456
7.	DISPATCHER_ID	123456
8.	STREET_ADDRESS	Example: 10123 N SHARP AV X W PIERCE ST SFV
9.	FIRST_IN_DISTRICT	7 (example Fire Station 07)
10.	CALLER_PHONE_NBR	213-256-8666
11.	CALL_TYPE	Landline, PBS, cellphone
12.	911-CR	Elapsed time (Calculated by application)
13.	CR-WRS	Elapsed time (Calculated by application)

14. 911-WRS	Elapsed time (Calculated by application)
15. 911-CREATION TIME * (TDS)	Elapsed Time (calculated by application)
16. CALL_TAKER_CONSOLE	C19
17. DISPATCHER_CONSOLE	C21
18. INCIDENT_TYPE	TDS code, example SS01
19. [TDS_CASE] CREATION_TIME *	TDS software invoked (* LAFD TDS_CASE table)
20. [TDS_CASE] COMPLAINT_TIME*	TDS software complaint card selected (* LAFD
21. [TDS_CASE] CPR_START_TIME *	TDS software emergency instructions activated

The Verint Recording Servers also include the capability to capture and tag E911 ANI/ALI information to the call database record. This will enable operations center staff to perform search and retrieval using ANI & ALI information.

Important Note: We will need to verify the Make/Model of the ANI/ALI controller and the availability of a useable ANI/ALI "CADSPILL" or Post Call CDR or Enhanced CDR. Testing may be required to verify usability of the data source.

Currently not part of the project scope: When LAFD goes to the Motorola P25 IP the recording will need to be converted to capture IP traffic from the Motorola AIS. To provide for the most robust recording solution for P25 Radio Recording, each "Primary" Recording server at the Public Safety Building Center as well as City Hall East (OCD), are also equipped to record the P25 Radio System. This Recording Server is designed to record all xxx Talk Groups from the Archive Information Server (AIS). In addition to recording the Audio from the P25 radio System, the Verint Recorder is to capture Radio metadata with each recorded transmission. This metadata is provided by the Motorola Archive Information Server and includes such info as Radio ID, Radio Alias, Talk group ID and Talk Group Alias. This will enable users to search and retrieve recorded radio communications based upon Talk group and/or Radio information.

5.2.1.4 Search and Playback

The Search and Retrieval of Recorded Communications is to be done using Verint's Web Based Application designed for Public Safety Users known as "Insight Center". Verint's Insight Center application provides a powerful, browser-based, set of tools for search and replay the recordings stored on your Verint Recording servers. Directly accessed from your desktop PC, with an easy-to-use browser interface, you can easily search for recordings by Recorded Channel, Date, Time, Duration, User Reference Tags, and other captured metadata from both the P25 ASTRO Radio system and the E-911 Switch. Playback audio is delivered via the local area network to the speakers of the client PC. Insight Center is certified to work with a Chrome Browser.

The Verint Installation Team will work with your defined Verint System Administrator to assign each individual agency use a Unique User Name and Password. Each user account will have certain permissions associated with it in order to play recordings back. Depending upon how a user account permissions have been configured, a user may be permitted to playback all recordings or may be restricted to only playing recordings from a limited subset of telephone extensions or Radio Talk Groups. If Playback permissions are limited, then the replay application will only show recordings for the Telephone Audio Channels or Radio Talk Groups to which have been assigned.

5.2.1.5 Call Storage

Verint's Recording Solutions are designed to fulfill the widest range of recording requirements while being one of the most efficient, easy-to-use and reliable solutions available. Verint's open architecture provides maximum storage flexibility, with dedicated internal RAID 5 Storage or call recordings, automatic call archiving to customer designed archive locations with native support for Network-Attached Storage (NAS), or SAN storage, RDX drive, using Verint's robust Archive Campaigns.

Each Recording Server is equipped with multiple hard drive arrays, one of which is specifically designed for storage, providing 3.8 TB of local storage.

5.3 VERINT SYSTEMS TECHNICAL OVERVIEW

The Verint v15.2 Recording Solution is able record voice communications in your operations center, whether they be in VoIP, TDM, or mixed telephony environments. Please keep in mind that as your center's technologies evolve and change, Verint has a solution for you. If anything is planned in your center during the next 2 years which is not included in this Solution Design, or has not be discussed with your Verint Representatives, please bring this to our attention as quickly as possible so that we may account for changing technologies within this design, or with future system updates.

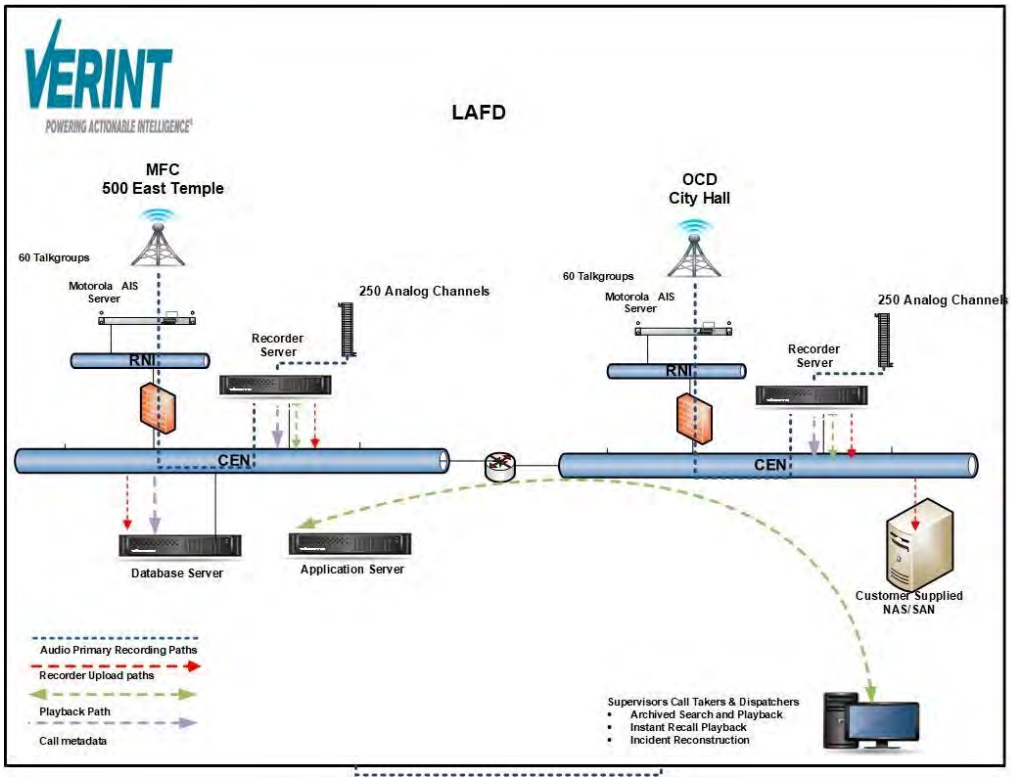


Figure 5-3: Verint System Diagram

5.3.1 Verint Recording – A Logical Architecture Overview

The system's logical architecture is based on three logical deployment zones:

- **Data Center** – Serves as a centralized, single point of access where application data and content metadata is accessed, managed and maintained
- **Recorder Site(s)** – Provides recording (content acquisition), content storage and integration with the customer environment
- **Desktop** – Provides the agent or supervisor's working environment

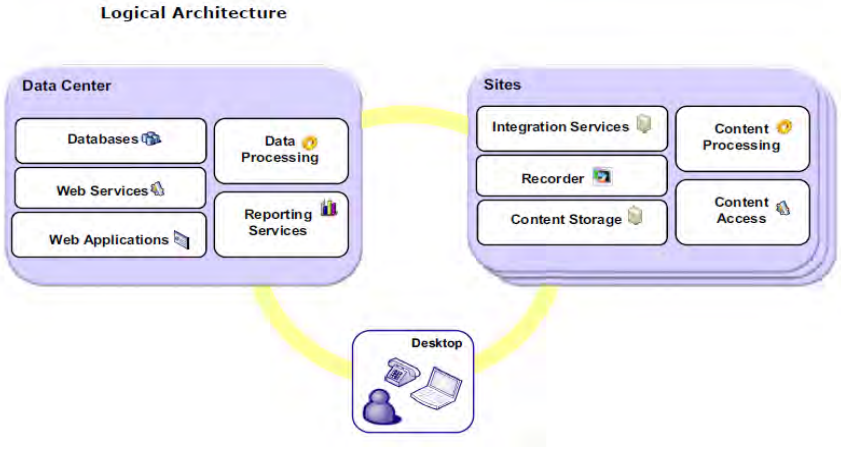


Figure 5-4: Verint Architecture

Every system deployment includes one Data Center, and one or more Recording Sites and Client Replay Desktops (depending on system size and scaling issues).

Dividing the system's functions into logical zones supports flexibility for different system scaling levels, streamlines the flow of data, enables easier and more efficient upgrade paths, and provides system security.

Maintaining the data in one single location (Data Center Zone) both protects sensitive system data and provides centralized access to data by authorized users. The Site zone can be configured in multiple instances with multiple servers, providing system flexibility and scalability.

Main system data is sent from the Site zone to the Data Center zone. The Site zone sends recorded content and other stored data to the Data Center zone. The Data Center zone provides a centralized, single location where this data can be accessed by users to view and modify. In turn, the Data Center zone sends user information and system configuration information to the Site zone, where it is then integrated into the customer's environment.

The software in the Data Center and Site zones can be upgraded separately, which enables easier upgrade processes. For example, the customer can upgrade the Data Center zone for new applications or new features, without the need to invest in upgrading the entire enterprise.

5.3.2 Data Center

The Data Center provides a single, central point of access for application and content metadata. Every system deployment includes one Data Center zone. Users access the Data Center to view and modify system stored and real-time data. Users who do not have access to the Data Center zone cannot log in to an application or access any of the data.

The Data Center hosts one or more database servers, depending on the size of the system deployment. Data Center zone databases contain the following information:

- System Management Data: Includes IT-oriented information on licenses, configuration, and data sources.
- Application Management Data: Includes business-oriented information on:
- User management: Includes users, hierarchy, roles, and user preferences
- Application management: Includes forms, flags, reports, and custom data

- Application Data: Includes raw recorded call information, evaluations, scorecard source measures, DPA data, Speech content, and excludes audio and screen records.
- Operational Data: Includes archived segment data indicating which segments are archived, including the information required to restore and play back a segment. Operational data is generated by the system and maintained in the database, and helps the system manage acquired structured and unstructured data.

5.3.3 Recorder Site Functions

The primary functions of the Recorder are to record, archive, and replay voice & screen recordings, Recorder features include:

- Full-time and selective, rules-driven recording
- Close integration with CTI data sources such as Motorola's AIS and E9-1-1 ANI/ALI
- Archiving support
- High-availability (Recording acquisition redundancy)
- Web-based administration & configuration

The recording solution consists of a set of logical servers that can be deployed on a single machine or on multiple machines in a large enterprise environment. These servers can also be deployed in the form of clusters in order to scale with the size of the customer's systems.

The Recorder supports both TDM and IP recording, including trunk-side recording (TDM) or gateway recording (IP), and station-side recording (TDM) or extension-side recording (IP) recording. You can configure each of these types of recording by using the Enterprise Manager to set up extension groups or pools (called member groups), each with a data source that defines where the recorded call is coming from, and then setting the recording mode.

5.3.4 Call Data and CTI Tagging

Call data captured by the Recorder includes associated and non-associated call data. Associated call data represents parameters of the call such as the start time, stop time and call length. In addition to the call data values, other data fields can be appended that contain any relevant data that is associated with the call. This data can be from switch CTI ports, and can be information such as an agent extension. Associated call data includes the following, which are logged with every call recorded:

- Start Date and Time
- End Date and Time
- Call length
- Dialed Digits (outbound)
- CLI Digits
- DNIS
- Call ID (unique to the call and Recorder)
- Call direction

Non-associated call data allows the Integration Service to place records into the database when they cannot be directly associated with a voice call (either because the call has finished or the inum of the call is unknown). At this point, a join is performed between some common element within the associated data, such as a unique ID from the CTI system, to allow this non-associated data to be added to the call details.

For Advanced Radio Recording environments with available Call Data for call tagging the following call data is typical to be tagged with each radio transmission recording:

- Radio ID & Radio Alias
- Talk Group Id & Talk Group Alias

Once you determine which fields you need to use in your system, you can add them as custom attributes, then map these custom attributes to an adapter. You can then use these attributes for tagging and to build recording rules, where the attributes become criteria upon which the decision to record or not is based.

5.3.5 Recorder Redundancy & High Availability

Recording provides high availability via redundancy of the Recorders, Integration Service, or both.

5.3.5.1 Recorder Redundancy

There are three types of Recorder Redundancy:

- N+N, in which all calls (or the desired redundant calls) are recorded by pairs of Recorders.

Important Note: N+N is the redundancy as designed for LAFD.

- N-Dedicated M-Shared, in which calls are recorded by a primary N Recorder, with a backup M Recorder available to take over should N experience any errors.
- N+M All Shared, in which all calls are load-balanced across a pool of Recorders.

5.3.5.2 High Availability Recorder Cluster

The diagram below illustrates a fully fault-tolerant Recorder cluster (N+M All Shared) containing redundant devices (the load balancing device, Link Protector, voice switch and Recorder). In this configuration, the failure of any single component will not result in the loss of recording. The cluster in this example has a recording capacity of 1000 channels (5 Recorders x 200 channels). Each Recorder has a capacity of 650 Channels so the spare capacity per recorder is 450 Channels, meaning that the system is tolerant of up to two (2) recorder failures at any moment in time.

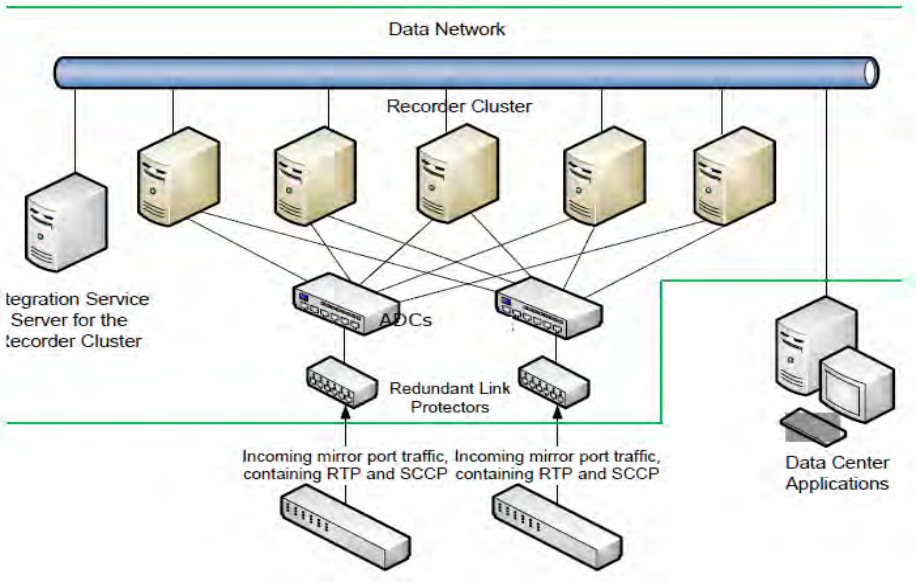


Figure 5-5: High Availability Design

The cluster is designed to be fault tolerant of key elements being offline for periods of time, and includes the following components:

- Data Center Zone application components: The servers for these components have no effect on the ability of the system to record. If the database is unavailable, the Recorders queue up the recorded calls. Once the database comes back online, the Recorders will upload the calls.
- Archive: This component is designed to run behind real-time archiving of the calls. The system would only be detrimentally affected if it was offline for a sustained period, such that when it came back online, calls to be archived were no longer on the Recorders. The hard disks on the recorders should be sized such that they can be tolerant of the Archive system running behind.
- Cluster Integration Service: In this configuration, the Integration Service is utilized for CTI Integrations and tagging. If the Integration Service server fails, then this tagging will be lost. If an extension must be recorded even during an Integration Service failure, it should not be configured in this mode.
- IP Recorder Nodes: As described above, the configuration in the diagram contains five recorders, but is specified as providing 4000 channels of concurrent recording, as the fifth recorder represents the spare capacity required for redundancy.
- ADC or Load Balancing Device: If either load balancer fails, the other passive device will be presented with the links via the Link Protectors. A network port failure would result in that individual link being activated to the redundant the load balancer.
- Link Protectors: If the Link Protector fails, then the network connection will be maintained to the primary the load balancing device via the protector's fail-through capability. The system is likely not to be fault tolerant of a Link Protector and load balancer failure at the same time.

5.3.6 Desktop (Search & Replay) Sites

The Desktop is the main component in the customer's environment that hosts software and certified third-party software. Depending on the package, the Desktop optionally contains the following types of clients required by agents to work with system servers:

- Insight Center Web Agent: Provides Multi-Channel, Multi-media Search, Replay and Incident Management for users. (Primary User Application for Recorded Call Replay)

Important Note: Insight Center has been designed to work in the customer's computer environment. In the rare case that conflicts exist between other applications, a stand-alone play back station provided by the customer may be required.

- Integration Services Agent: Retrieves and acquires agent information, and extend contact metadata with data available only on the agent desktop.
- Content Access Client: Provides Playback Control (Interactions and Analytics)
- Thick Client Applications: Includes Form Designer (Interactions and Analytics)

5.3.7 Archive Storage Topologies

After a recorder has completed recording a contact, it stores it on its local disk. The recorder's call storage drive, no matter how large, has some limit to its capacity. Therefore, at some point, the older contacts need to be moved to long-term storage.

"Archive" refers to the infrastructure dedicated to preserving call information in long-term storage (usually for one year and longer, depending on customer requirements). The archive service transfers recorded content from recorders to specific storage media for preservation.

The following are the two different archive topologies that can be configured:

- Local Archive Topology: Recorders push contacts directly from their local call buffer to the target media.
- Central Archive Topology: Central archive server is configured to pull contact data from Recorders and write this data to the target media.

Each type of archive (local or central) can be deployed in different configurations. To determine which type of archive should be used depends on the topology best suited for a customer's specific requirements.

Verint supports most industry standard Network Storage Strategies and devices. Examples supported, but not limited to are: RDX drive, NAS, SAN, EMC Centera, Public Cloud Services and Private Cloud.

5.3.8 Web Applications

All users log on to the system through Web applications. A single point of authentication—Single Sign-On (SSO)—provides application access in the system, as defined by user privileges. Web applications run application pages with system management and application management data. It is mainly structured information. Unstructured information is accessed directly from the Site zone in which it was recorded or archived.

The application cluster consists of one or more application servers, depending on the deployment size. In large deployments with more than one server, the application servers are deployed behind a Network Load Balancer (NLB) and each server exposes the same set of applications and services. All application servers run the same version of software and have an identical configuration. Users access the system from the URL of the NLB. The NLB routes the user to one of the application servers.

5.3.9 Insight Center: Search, Replay and Incident Management

Insight Center provides a powerful, browser-based, set of tools to search for and play the recordings stored on your Verint enterprise recording system from your desktop PC. With an easy-to-use browser interface, you can easily search for recordings by channel, agent, date and time, or any available metadata associated with the recording.

Insight Center allows you to playback multiple sequenced and/or simultaneous recordings, regardless of which channel they were recorded on. This allows you to reconstruct an incident by listening to a series of recordings in their entirety, even if the recordings overlap. Selected recordings can then be saved to an incident folder for ease of incident management. To assist you when creating a transcript of the recordings, you can configure Insight Center to provide a spoken time and date stamp at the beginning and end of the selected sequence of recordings. Insight Center plays the selected recordings in chronological order.

Verint's Recording solutions provide for full-time recording, selective recording, recording on demand, and dial-in recording across digital and analog telephones, trunked and conventional Land Mobile Radio systems, telephone lines and trunks, IP phones, short message service (SMS), and PC screens. It can record screens while minimizing network usage and storage requirements and can capture screen changes, including mouse movements and keystrokes, without disrupting call handlers.

Insight Center is designed to address the replay and incident management of these multi-media Interactions along with Multi-Channel mixing capabilities to allow effective Incident Reconstruction in the emergence of NG9-1-1 Technology, including replay capabilities for: Audio, Video, PC Screen Capture, Still Photos and Text messaging.

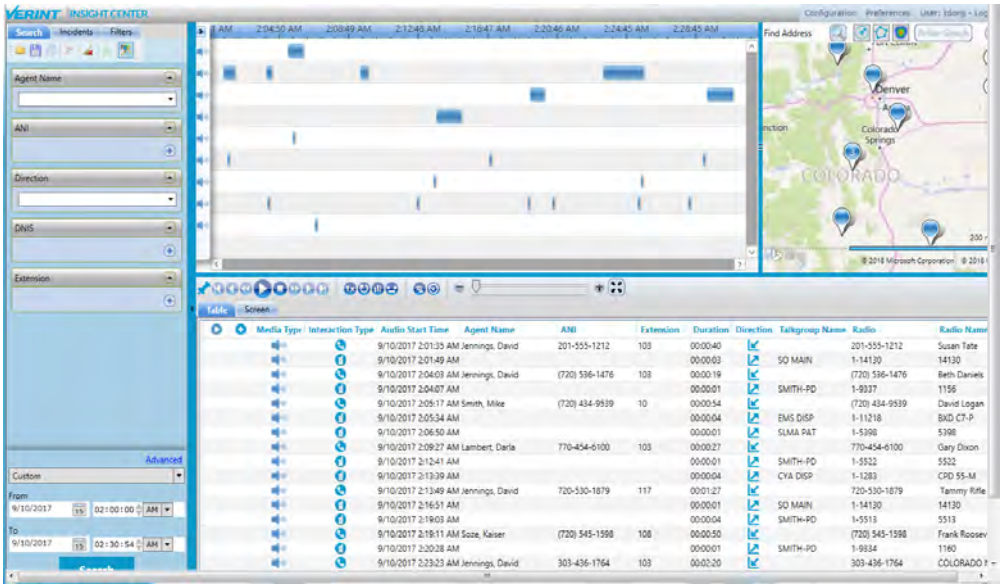


Figure 5-6: Insight Center User Interface

SECTION 6

SYSTEM NETWORK REQUIREMENTS

6.1 LINK REQUIREMENTS

- Layer 3, MPLS Ethernet Backhaul
  - 3 Layers of QoS is highly suggested
- IPKeys services are included for Cisco Router configuration
- One port, per router, per site will be required
- Motorola's design assumes 99.999% uptime reliability of the Microwave and MPLS backhaul.

6.1.1 Bandwidth, Latency, & Jitter Requirements

Link Name	Min. Bandwidth	Max. Latency	Max. Jitter
Prime Site (MFC) to Each RF Site	2,200 Kbps	20ms	20ms
OCD Dispatch to Core (MFC)	10,617 Kbps	20ms	10ms
MFC to OCD (Logging)	20 Mpbs	20ms	10ms

If multiple sites connect through the same link the bandwidth aggregate needs to be considered. For example, if a remote site and the OCD dispatch center use the same connection to MFC the available bandwidth will need to be 12,817 kbps (10,617 kbps + 2,200 kbps).

6.1.2 Cisco MPLS Configuration

Motorola, through our subcontractor IPKeys, has included configuration of the existing Cisco MPLS routers in use on the Microwave network. This work includes initial configuration only and does not include any hardware modifications or upgrades.

6.2 POWER & HVAC LOADING SPECIFICATIONS

MFC Master Site

120 VAC POWER REQUIREMENTS

Equipment	Qty	Voltage (VAC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack#	Circuit#	Breaker Size
Core VMS 01 Power Supply #1	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1	Circuit #1	20A
Core VMS 02 Power Supply #2	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1		
CEN VMS 01 Power Supply #1	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1	Circuit #2	20A
ISGM VMS 01 Power Supply #2	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1		
Core LAN Switch 01	1	120	0.9	0.9	100%	0.9	108	108	108	369	369	1	Circuit #3	20A
Core Edge Router 01	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
Core Backhaul Switch 01	1	120	0.9	0.9	100%	0.9	108	108	108	369	369	1		
CEN Firewall	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
CEN LAN Switch	1	120	0.9	0.9	100%	0.9	108	108	108	369	369	1		
Terminal Server	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
Core VMS 01 Power Supply #2	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1	Circuit #4	20A
Core VMS 02 Power Supply #1	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1		
CEN VMS 01 Power Supply #2	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1	Circuit #5	20A
ISGM VMS 01 Power Supply #1	1	120	6.7	6.7	100%	6.7	800	800	800	2,730	2,730	1		
Core LAN Switch 02	1	120	0.9	0.9	100%	0.9	108	108	108	369	369	1	Circuit #6	20A
Core Edge Router 02	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
Core Backhaul Switch 02	1	120	0.9	0.9	100%	0.9	108	108	108	369	369	1		
Border Router	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
ISSI Firewall	1	120	2.5	2.5	100%	2.5	300	300	300	1,024	1,024	1		
Network Management Client	1	120	3.3	3.3	100%	3.3	400	400	400	1,365	1,365	1		
Total 120 VAC Power Requirements				**76.2**		**76.2**		**9,140**	**9,140**		**31,187**			

MFC Simulcast Prime Site

120 VAC POWER REQUIREMENTS

Equipment	Qty	Voltage (VAC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack#	Circuit#	Breaker Size
Prime LAN Switch No.1	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1	Circuit #1	15A
Prime LAN Switch No.2	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1	Circuit #2	15A
Access Switch No.1	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1	Circuit #1	15A
Access Switch No.2	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1	Circuit #2	15A
Total 120 VAC Power Requirements				**3.3**		**3.3**		**400**	**400**		**1365**			

-48 VDC POWER REQUIREMENTS

Equipment	Qty	Voltage (VDC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack #	DC Brkr #	Breaker Size
Site Controller (DC, 2 modules/chassis)	2	48	1.3	2.5	100%	2.5	60	120	120	205	409	1	DC Breaker 1	5A
Comparators Ch. 1 & 2	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 2	5A
Comparators Ch. 3 & 4	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 3	5A
Comparators Ch. 5 & 6	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 4	5A
Comparators Ch.7 & 8	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 5	5A
Comparators Ch. 9 & 10	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 6	5A
Comparators Ch. 11 & 12	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 7	5A
Comparators Ch. 13 & 14	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 8	5A
Comparators Ch. 15 & 16	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 9	5A
Comparators Ch. 17 & 18	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 10	5A
Comparators Ch. 19 & 20	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Breaker 11	5A
TRAK Modular Frequency Clock - PS1	1	48	3.1	3.1	100%	3.1	150	150	150	512	512	1	DC Breaker 12	5A
TRAK Modular Frequency Clock - PS2	1	48	3.1	3.1	100%	3.1	150	150	150	512	512	1	DC Breaker 13	5A
Access Router No.1	1	48	1.00	1.0	100%	1.0	48	48	48	164	164	1	DC Breaker 14	5A
Access Router No.2	1	48	1.00	1.0	100%	1.0	48	48	48	164	164	1	DC Breaker 15	5A
Sub-Site Router No.1	1	48	1.00	1.0	100%	1.0	48	48	48	164	164	1	DC Breaker 16	5A
Sub-Site Router No.2	1	48	1.00	1.0	100%	1.0	48	48	48	164	164	1	DC Breaker 17	5A
Total -48 VDC Power Requirements				**29.4**		**29.4**		**1,412**	**1,412**		**4,818**			

800MHz Remote TX/RX Site

-48 VDC POWER REQUIREMENTS

Equipment	Qty	Voltage (VDC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack #	DC Brkr #	Breaker Size
GTR 8000 Base Radio Subsystem 800MHz Channel 1	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #1	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 2	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #2	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 3	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #3	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 4	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #4	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 5	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #5	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 6	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #6	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 7	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #7	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 8	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #8	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 9	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #9	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 10	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	1	DC Brkr #10	25A
TRAK Modular Frequency Clock - PS1	1	48	3.1	3.1	100%	3.1	150	150	150	512	512	1	DC Brkr #11	5A
TRAK Modular Frequency Clock - PS2	1	48	3.1	3.1	100%	3.1	150	150	150	512	512	1	DC Brkr #12	5A
Site Router 01	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Brkr #13	5A
CCGW #3	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Brkr #14	5A
CCGW #4	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	1	DC Brkr #15	5A
120VAC Power Converter (LAN Switch #1)	1	48	6.3	6.3	100%	6.3	300	300	300	1,024	1,024	1	DC Brkr #16	10A
GTR 8000 Base Radio Subsystem 800MHz Channel 11	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #17	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 12	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #18	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 13	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #19	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 14	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #20	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 15	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #21	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 16	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #22	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 17	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #23	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 18	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #24	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 19	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #25	25A
GTR 8000 Base Radio Subsystem 800MHz Channel 20	1	48	9.0	9.0	100%	9.0	430	430	430	1,467	1,467	2	DC Brkr #26	25A
CCGW #3	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	2	DC Brkr #27	5A
CCGW #4	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	2	DC Brkr #28	5A
Site Router 02	1	48	1.7	1.7	100%	1.7	80	80	80	273	273	2	DC Brkr #29	5A
120VAC Power Converter (LAN Switch #2)	1	48	6.3	6.3	100%	6.3	300	300	300	1,024	1,024	2	DC Brkr #30	10A
Total -48 VDC Power Requirements				**207.9**		**207.9**		**9,980**	**9,980**		**34,053**			

MFC Dispatch Site

120 VAC POWER REQUIREMENTS

Equipment	Qty	Voltage (VAC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack#	Circuit#	Breaker Size
Site Gateway 01	1	120	0.5	0.5	100%	0.5	60	60	60	205	205	1		
LAN Switch 01	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1		
Proxy Server 01	1	120	5.0	5.0	100%	5.0	600	600	600	2,047	2,047	1	Circuit #1	20A
Conventional Channel Gateway (CCGW) 1-2	2	120	0.5	1.0	100%	1.0	60	120	120	205	409	1		
Conventional Site Controller	1	120	2.9	2.9	100%	2.9	350	350	350	1,194	1,194	1		
Site Gateway 02	1	120	0.5	0.5	100%	0.5	60	60	60	205	205	1		
LAN Switch 02	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1		
Proxy Server 02	1	120	5.0	5.0	100%	5.0	600	600	600	2,047	2,047	1	Circuit #2	20A
Conventional Channel Gateway (CCGW) 3-4	2	120	0.5	1.0	100%	1.0	60	120	120	205	409	1		
Proxy Firewall	1	120	2.0	2.0	100%	2.0	240	240	240	819	819	1		
Verint Server #1	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #3	15A
Verint Server #2	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #4	15A
Verint Server #3	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #5	15A
Verint Server #4	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #6	15A
ASX Dispatch Position	72	120	5.0	360.0	100%	360.0	600	43,200	43,200	2,047	147,405	N/A	N/A	N/A
ASX Dispatch Audio Interface	72	120	0.4	30.0	100%	30.0	50	3,600	3,600	171	12,284	N/A	N/A	N/A
ASX Dispatch Monitor	72	120	0.3	19.8	100%	19.8	33	2,376	2,376	113	8,107	N/A	N/A	N/A
Total 120 VAC Power Requirements				**469.4**		**469.4**		**56,326**	**56,326**		**192,192**			

OCD Dispatch Site

120 VAC POWER REQUIREMENTS

Equipment	Qty	Voltage (VAC)	Current per Unit (A)	Total Current (A)	Duty Cycle (%)	Total Current (A) @ Duty Cycle	Power per Unit (W)	Total Power (W)	Total Power (W) @ Duty Cycle	BTU/hr per Unit	Total BTU/hr	Rack#	Circuit#	Breaker Size
Site Gateway 01	1	120	0.5	0.5	100%	0.5	60	60	60	205	205	1		
LAN Switch 01	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1		
Proxy Server 01	1	120	5.0	5.0	100%	5.0	600	600	600	2,047	2,047	1	Circuit #1	20A
Conventional Channel Gateway (CCGW) 1-2	2	120	0.5	1.0	100%	1.0	60	120	120	205	409	1		
Conventional Site Controller	1	120	2.9	2.9	100%	2.9	350	350	350	1,194	1,194	1		
Site Gateway 02	1	120	0.5	0.5	100%	0.5	60	60	60	205	205	1		
LAN Switch 02	1	120	0.8	0.8	100%	0.8	100	100	100	341	341	1		
Proxy Server 02	1	120	5.0	5.0	100%	5.0	600	600	600	2,047	2,047	1	Circuit #2	20A
Conventional Channel Gateway (CCGW) 3-4	2	120	0.5	1.0	100%	1.0	60	120	120	205	409	1		
Proxy Firewall	1	120	2.0	2.0	100%	2.0	240	240	240	819	819	1		
Verint Server #1	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #3	15A
Verint Server #2	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #4	15A
Verint Server #3	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #5	15A
Verint Server #4	1	120	10.0	10.0	100%	10.0	1200	1,200	1,200	4,095	4,095	2	Circuit #6	15A
ASX Dispatch Position	28	120	5.0	140.0	100%	140.0	600	16,800	16,800	2,047	57,324	N/A	N/A	N/A
ASX Dispatch Audio Interface	28	120	0.4	11.7	100%	11.7	50	1,400	1,400	171	4,777	N/A	N/A	N/A
ASX Dispatch Monitor	28	120	0.3	7.7	100%	7.7	33	924	924	113	3,153	N/A	N/A	N/A
Total 120 VAC Power Requirements				**219.0**		**219.0**		**26,274**	**26,274**		**89,651**			

6.3 RACKFACE DIAGRAMS

Transmit / Receive Site

RU	800MHz Rack	800Mhz Rack	RF Rack	DC Power Rack
48				DC Breakers
47	Rack RMC	Rack RMC		
46			Site RMC	
45				DC Breakers
44	TRAK 9100 GPS Clock		Junction Panel	
43				
42			Junction Panel Open Space	
41				DC Breakers
40				
39			RX Tray	
38				
37			Site-LNA	
36	CCGW #1	CCGW #3	TX Filter #1	
35	CCGW #2	CCGW #4		
34			TX Filter #2	
33	LAN Switch #1	LAN Switch #2		
32	Site Router #1	Site Router #2		
31				
30				
29	GTR #1	GTR #11		
28				
27			800MHz Combiner #1	
26	GTR #2	GTR #12		
25				
24				
23	GTR #3	GTR #13		
22				
21				
20	GTR #4	GTR #14	800MHz Combiner #2	
19				
18				
17	GTR #%	GTR #15		
16				
15				
14	GTR #6	GTR #16	800MHz Combiner #3	
13				
12				
11	GTR #7	GTR #17		
10				
9				
8	GTR #8	GTR #18	800MHz Combiner #4	
7				
6				
5	GTR #9	GTR #19		
4				
3				
2	GTR #10	GTR #20		
1				

DC Rectifiers

Prime Site Location

RU	Prime Site Rack	DC Power Rack
48	TRAK 9100 GPS Clock	DC Breakers
47		
46		
45		DC Breakers
44		
43	Site Router #1	
42	Site Router #2	DC Breakers
41	LAN Switch #1	
40	LAN Switch #2	
39	Sub-Site Router #1	
38	Sub-Site Router #2	
37	Backhaul Switch #1	DC Rectifiers
36	Backhaul Switch #2	
35	CCGW #1	
34	CCGW #2	
33	CCGW #3	
32	CCGW #4	
31		
30	GRV #19 & #20	
29		
28		
27	GRV #17 & #18	
26		
25		
24	GRV #15 & #16	
23		
22		
21	GRV #13 & #14	
20		
19		
18	GRV #11 & #12	
17		
16		
15	GRV #9 & #10	
14		
13		
12	GRV #7 & #8	
11		
10		
9	GRV #5 & #6	
8		
7		
6	GRV #3 & #4	
5		
4		
3	GRV #1 & #2	
2		
1		

Dispatch Location

RU	Dispatch	Logging Recorder
48	AC Breakers	AC Breakers
47		
46		
45		
44		
43		
42		
41	Site Router #1	Logging Recorder LAN Switch
40	Site Router #2	
39	LAN Switch #1	NICE Logging Recorder
38	LAN Switch #2	
37	Firewall #1	
36		
35	Aux I/O	NICE NRX Logging Recorder
34		
33	CCGW #1	
32	CCGW #2	
31	CCGW #3	NICE Storage Center
30		
29	MCC7500 Proxy Server	
28		
27		
26		KVM
25		
24		
23		
22		
21		
20		
19		
18		
17		
16		
15		
14		NICE Replay Station
13		
12		
11		
10		MCC7500 AIS VPM
9		MCC7500 AIS
8		
7		
6		
5		
4	GCP 8000 Site Controller	
3		
2		
1		

SECTION 7

COVERAGE MAPS

The sub-sections below contain the coverage prediction maps for the proposed solution.

7.1 GUARANTEED MAP

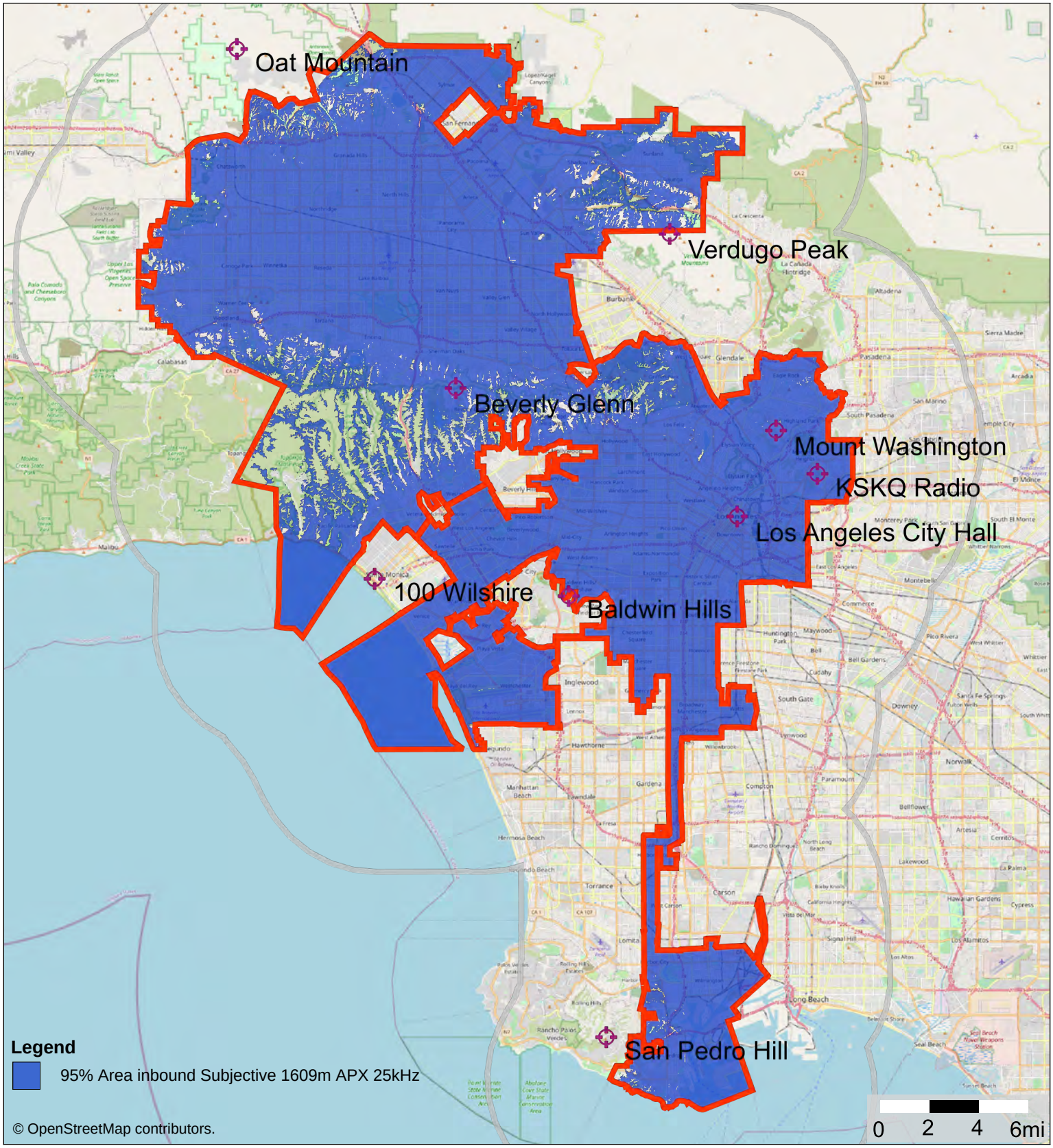
7.1.1 Portable – 25kHz Inbound

Los Angeles Fire Department - 800MHz Analog VRS

This map is subject to change based upon as-built configuration.

MOTOROLA SOLUTIONS

DAQ3.0 - 25kHz APX Portable Inbound



Printed: 7/29/2021
System version: 2.8.7

3W APX8000HXE w. XE Antenna
Belt Clip w. XE RSM
Portable on Street

Solution: CA_LAFD
Project: 2021 LAFD Analog
Design: Design 12 Alex_CATP_IB_Subj
fhd786

This map in intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

7.2 INFORMATIONAL PURPOSES ONLY MAPS

7.2.1 Portable – 25kHz Outbound

MOTOROLA SOLUTIONS

Los Angeles Fire Department - 800MHz Analog VRS

This map is not guaranteed and is subject to change based upon as-built configuration.

Information Only: 25kHz APX Portable Outbound

Printed: 7/29/2021
System version: 2.8.7

3W APX8000HXE w. XE Antenna
Belt Clip w. XE RSM
Portable on Street

Solution: CA_LAFD
Project: 2021 LAFD Analog
Design: Design 16
fhd786

This map in intended solely for the equipment configuration stated above.
Coverage can vary significantly if different configurations are used.

7.2.2 Mobile – 25kHz Inbound