NGEN L3HARRIS CORE UPGRADE AND CITY OF GREENFIELD SITE PROJECT COORDINATION AND EFFICIENCY PLAN

MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN COUNTY OF MONTEREY AND CITY OF GREENFIELD

This MOU is entered into effective as of the date executed by all parties by and between the County of Monterey (the "County") and the City of Greenfield ("Greenfield") for the purpose of defining their respective obligations relating to the coordination and implementation of the Next Generation Radio Network Core Upgrade Capital Improvement Project ("NGEN Core Upgrade") and the City of Greenfield Site Project ("GSP").

I. Mission

The mission of the partnership under this MOU is to promote the development and maintenance of radio network infrastructure in the County of Monterey through the efficient use of public funds.

II. Purpose and Scope

The County's Next Generation Radio Network ("NGEN") system is comprised of land mobile radio technology that provides county-wide radio coverage using supplemental and overlapping P25 digital trunked and analog conventional systems.

Numerous cities, fire districts and other organizations, including Greenfield are parties to the Agreement for NGEN Services and Governance and utilize NGEN services.

The NGEN Core Upgrade has been approved as part of the NGEN 5-year Capital Improvement Plan and recommended by the NGEN Executive and Operations Boards as a Fiscal Year 2024-2025 project.

The purpose of the NGEN Core Upgrade is to replace aging NGEN Cores and dispatch consoles.

The County intends to work with third-party vendor L3Harris to complete the NGEN Core Upgrade.

Greenfield has obtained grant funding for the purpose of improving NGEN system coverage within its city limits.

The purpose of the GSP is to support NGEN coverage through the construction of a radio shelter to house a new NGEN site.

Greenfield also intends to work with L3Harris to complete the GSP.

The County and Greenfield have determined that the NGEN Core Upgrade and the GSP can be completed at substantial cost savings by implementing both projects concurrently under a single scope of services with L3Harris.

The County is party to an existing agreement with L3Harris that can be utilized to complete both the NGEN Core Upgrade and GSP.

The activities, processes and efforts under this MOU are meant to:

A. Define the scope of the NGEN Core Upgrade – GSP joint project ("Joint Project").

B. Direct the County to enter into an agreement with L3Harris to complete the Joint Project.

C. Apportion the costs of the project between the parties and establish a protocol for invoices and payments.

D. Establish a mechanism for the resolution of disputes between the parties.

III. Responsibilities

A. The County agrees to:

1. Contract directly with L3Harris to complete the Joint Project on terms substantially similar to the scopes of services attached hereto as **Exhibit A**.
2. Manage the Joint Project with input from Greenfield with respect to the GSP.
3. Timely make all payments under the L3Harris Agreement directly to the vendor.
4. Timely and accurately invoice Greenfield for its share of the Joint Project costs.

B. City of Greenfield agree to:

1. Timely reimburse the County for its share of the Joint Project costs as detailed in Article IV of this MOU.
2. Cooperate with the County and L3Harris to ensure the timely completion of the GSP portion of the Joint Project.

C. The County and Greenfield will designate individuals to serve as Contact Persons specific to this MOU.

1. The Contact Persons for each party shall be responsible for ensuring that each party fulfills its financial responsibilities in accordance with this MOU.
2. The Contact Persons will also be charged with monitoring the processes of this MOU to ensure mission success.

IV. Terms of Understanding

D. Financial Responsibilities.

1. The County will receive all invoices and make all payments to L3Harris in accordance with schedule attached hereto as **Exhibit B**.

2. Upon receiving an invoice from L3Harris, and prior to making payment, the County will invoice Greenfield for an amount equal to 23% of the invoice amount as set forth in the schedule.

3. The County, Emergency Communications Department (ECD), will send all invoices to the Greenfield City Manager via email:

City of Greenfield
c/o Paul Wood - City Manager
pwood@ci.greenfield.ca.us
and, Isabel Guerrero
iguerrero@ci.greenfield.ca.us

4. Greenfield agrees to reimburse the County for its share of the Joint Project expenses invoiced by L3Harris within thirty (30) days of the date of the County's invoice.

5. Payments are considered late after 30 days of non-payment by Greenfield and shall accrue a 5% penalty on any amount owed every 30 days until paid in full. If Greenfield does not pay the delinquent amount and any delinquency fee within ninety (90) calendar days from the Due Date, the County is authorized to withhold and offset from any lawful source whatsoever otherwise due to the Party, including the regular apportionment of property tax revenue, an amount sufficient to satisfy the delinquent amount and delinquency fees.

6. After receiving payment from Greenfield, the County will promptly pay L3Harris.

7. The parties will each be individually responsible for any cost overruns to the extent that the additional costs are attributable to either the NGEN Core Upgrade or the GSP components of the Joint Project. Greenfield shall only be responsible for cost overruns related to the GSP.

8. County will seek prior approval from Greenfield before incurring additional costs that result in cost overruns related to the GSP.

9. If the parties disagree as to the apportionment of any cost overruns, the parties agree to abide by the terms determined by a majority vote of the NGEN Executive Board.

E. Duration.

1. This MOU shall remain in effect until Joint Project is complete and all payments are made, or until this MOU is otherwise terminated as set forth under Part D below.

F. Modifications

1. Modifications to this MOU shall have no force and effect unless such modifications are in writing and signed by an authorized representative of both parties.
2. The parties agree to exercise best efforts to incorporate any necessary change orders or other changes dictated by changes to the Joint Project into this agreement.

G. Termination

1. The County may terminate this MOU if Greenfield breaches this MOU by failing to comply with the terms and provisions herein, including by failing to make timely payments. The County will provide written notice to Greenfield within a reasonable time of discovery of the breach. Greenfield will have ten (10) calendar days from the date of the notice to cure the breach. If Greenfield fails to commence to cure the breach by the close of business on the 10th calendar day, the MOU may be terminated immediately. County shall thereafter provide written notice confirming termination.
2. Greenfield may terminate this MOU if the County breaches this MOU by failing to comply with the terms and provisions herein. Greenfield will provide written notice to County within a reasonable time of discovery of the breach. County will have ten (10) calendar days from the date of the notice to cure the breach. If County fails to commence to cure the breach by the close of business on the 10th calendar day, the MOU may be terminated immediately. Greenfield shall thereafter provide written notice confirming termination.

H. Liability

1. The County and City of Greenfield agree to assume the risks incumbent to the Joint Project and agree to hold each other harmless should any act performed pursuant to this MOU cause damage or loss to another party to this MOU, unless the damage or loss results from that parties' gross negligence. The parties agree to be solely responsible for the negligent or wrongful acts or omissions of their respective employees, contractors, agents, governing boards, and assigns to the extent allowable by law, and will not seek financial contributions from the other parties for such acts or omissions.

2. County acknowledges that it has contracted directly with L3Harris to complete the Joint Project and, as such, that County assumes all liability arising out of said contract. Greenfield shall not be liable for any loss, damage, or default related to the contract between L3Harris and County expect as provided in this MOU.

V. Parties

A. Contact Persons

	Contact Person	Contact Information
County of Monterey	Thomas Montoya IT Manager Radio Comm	montoyatl@countyofmonterey.gov 831-796-6433
City of Greenfield	Guillermo Mixer Chief of Police	gmixer@co.greenfield.ca.us 831-674-5111

B. Authorization

The following signatories authorize the participation of the organization they represent in this MOU.

County of Monterey:

Information Technology Eric Chatham Chief Information Officer	Signature/Date:
Samuel Beiderwell Deputy County Counsel	Signature/Date:

City of Greenfield:

City of Greenfield Robert White Mayor	Signature/Date: Signed by: Robert White EBA5C17420A448A... 10/16/2024 | 4:57 PM PDT

Additional Terms and Conditions
Negotiated in Accordance with Sourcewell Contract Article 6(B)
and Monterey County Sourcewell ID #18170

A. TERM:

This Agreement shall be effective upon the date of the last signature hereto (the "Effective Date"). The term of this Agreement shall commence upon the Effective Date of this Agreement and shall run through the end of the Warranty Period as defined herein. The term of the Software license is set forth in the Software License Agreement.

B. PRICE:

The Total Agreement Price to be paid by Buyer to Seller is Two Million, Four Hundred Thousand Seventy-Nine, Six Hundred Sixty-Six United States Dollars and Forty Cents ($2,479,666.40). The individual prices for the units of the Hardware, the Software licenses and the Services to be performed are as set forth in the Price Summary as an attachment to the Statement of Work.

C. Detailed Design Review. The Detailed Design Review ("DDR") phase will commence after the Effective Date of the Agreement, and conclude at a mutually acceptable time to maintain adherence to the Project Schedule. During the DDR, the duly authorized representative designated to manage Seller's obligations hereunder ("Seller's Project Manager") will meet with Buyer's project team on one or multiple occasions to review the design, technical data, and site specific information to be provided in accordance with the Agreement Documents. At the conclusion of the DDR, Seller will provide Buyer with the following documents (the "Detailed Design Documents" or "DDR Documents") for review and approval by Buyer, if required by the project:

- Final Siting Plans
- Project Schedule
- Rack Elevation Drawings
- System Block and Level Diagrams
- Power and HVAC Loads
- Acceptance Test Plans
- Any other documents as mutually agreed upon by the parties

Buyer shall have fourteen (14) days to conduct its review of the above documents. Approval of Detailed Design Documents by the Buyer shall not be unreasonably withheld, conditioned or delayed.

D. Goods/Services. L3Harris shall provide the Hardware, Services and Software, to the County of Monterey, in accordance with the Agreement Documents as such term is defined herein (collectively, the "Work").

E. Project Schedule. Updates to the start dates and durations will be made as the information evolves and will be mutually agreed upon by both parties or updated as otherwise provided herein.

F. Buyer Approvals. Buyer will review and respond with reasonable promptness to all submittals or other items requiring its approval under this Agreement. For all such submittals or other items Buyer will provide the Seller with either; (i) written notification of Buyer's approval, or (ii) a written

notification of conditional approval subject to Seller providing prompt correction of any noted deficiency, or (iii) in the case of a submittal that does not meet the requirements of the Agreement, a written notification of Buyer's disapproval. Buyer's disapproval notification will be provided with reasonable detail to sufficiently advise Seller of the basis on which the submittal was determined to be unacceptable. Buyer agrees that, except as otherwise provided, failure to provide approval, conditional approval or non-approval of a submittal for which its approval is required within fifteen (15) days of receipt of the submittal from the Seller shall constitute approval of the submittal. The parties agree that this section, Project Management and Planning, does not relate to the Testing and Acceptance procedures in the Testing and Acceptance section of this Agreement.

G. Access. Buyer shall provide access, at no cost to Seller, to all owned, leased, or licensed Project Sites at reasonable times, and with an escort (if required) at no charge, upon reasonable prior notification from Seller. Buyer shall ensure sufficient room, within reason, for construction vehicles used by Seller. Buyer shall issue temporary identification cards to Seller's personnel and its authorized subcontractors, if required, for access to any of the Project Sites.

H. DELIVERY, TITLE AND RISK OF LOSS:

(i) **Infrastructure Hardware**. Seller shall ship the equipment, goods, and materials to be supplied by Seller for the Work as further described in the Statement of Work attached to this Agreement as an exhibit (collectively, the "Infrastructure Hardware") to Buyer at Buyer's expense on or before the dates set forth in the Project Schedule. Partial deliveries shall be permitted. Upon delivery to the first carrier, title to each portion of the Hardware and all risk of loss or damage shall pass to Buyer. Infrastructure Hardware may be shipped directly to Buyer or to a mutually agreed upon staging or storage location. Buyer shall keep the Hardware fully insured for the total amount of all monies then due, or yet to become due, to Seller with respect to this Agreement.

(ii) **Terminal Hardware**. If applicable, Seller shall ship any Terminal Hardware to Buyer at Buyer's expense on or before the dates set forth in the Project Schedule. Partial deliveries shall be permitted. Upon delivery to the first carrier, title to each portion of the Hardware and all risk of loss or damage shall pass to Buyer.

I. CHANGES AND ADDITIONS:

(i) **Hardware Changes**. In the event of any change in the Hardware as a result of the imposition after the Effective Date of this Agreement of any requirements by any federal, state, or local government, Seller shall be entitled to an equitable adjustment, by Change Order, in the Total Agreement Price, the Project Schedule, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

(ii) **Buyer Requested Changes.** Buyer may request changes in or additions to the Work or in the time or place of performance of the Work under this Agreement. If any such change causes an increase or decrease in the cost of, or the time required for, performance of any part of the Work under this Agreement, Seller shall be entitled to an equitable adjustment, by Change Order, in the Total Agreement Price, the Project Schedule, or both. Any such adjustment in the Total Agreement Price or Project Schedule shall be mutually satisfactory to Buyer and Seller. Price increases and/or extensions of time shall not be binding upon either Party unless and until evidenced by a Change Order signed by the parties hereto.

(iii) **Product Discontinuance**. Subject to its obligation to fulfill its obligations set forth in the Agreement, Seller reserves the right to change or to discontinue any product covered by the Agreement provided that Seller agrees to make available to the Buyer a functionally equivalent replacement product equal to or better than the product discontinued.

J. PAYMENTS:

(i) The Total Agreement Price shall be paid by the Buyer to Seller in accordance with the payment milestone schedule as set forth in the Price Summary attached to the Statement of Work.

(ii) **Invoices and Electronic Funds Transfer**

Unless otherwise agreed by the parties, Seller shall electronically submit invoices using Seller's standard invoice template. Buyer shall pay all invoices via Electronic Funds Transfer ("EFT") directly to Seller's banking institution using Seller's banking information and EFT instructions below.

L3Harris Technologies, Inc.
Bank of America, New York, NY 10038
Account No.: 4451124230
Routing/ABA (ACH ONLY): 111000012
Routing/ABA (Wire ONLY): 026009593

(iii) **Payment Dates**

The Payment(s) associated with the event(s) above shall be due thirty (30) days following the date of Seller's invoice.

K. SUBCONTRACTING:

Seller may subcontract any portion of Work to be performed by Seller hereunder provided that Seller shall be responsible for the performance and Work of any such subcontractors.

L. EXCUSABLE DELAYS:

Seller shall not be liable for delays in delivery or failure to perform due directly or indirectly to: (1) causes beyond Seller's reasonable control, (2) Acts of God, acts (including failure to act) of any governmental authority (de jure or de facto), wars (declared or undeclared), riots, revolutions, strikes or other labor disputes, fires, floods, sabotage, nuclear incidents, earthquakes, storms, epidemics, (3) Seller's inability to timely obtain necessary materials, items, components or services from suppliers who are affected by the foregoing circumstances, or (4) Buyer Delays in Performance of its obligations hereunder in a timely manner. The foregoing shall apply even though any of such causes exists at the time of signature of the Agreement by Seller or occurs after delays in Seller's performance of its obligations due to other reasons. In the event of such delay, the time of delivery or of performance shall be extended for a reasonable time period to compensate for the time lost by Seller by reason of the delay.

M. TESTING AND ACCEPTANCE:

(i) Seller shall notify Buyer that the Work is ready for the testing procedures attached to the Statement of Work and mutually agreed upon by Buyer and Seller to be performed to determine whether the Work has met the Acceptance criteria either set forth in the Statement of Work or as mutually agreed upon

in writing by Buyer and Seller ("Acceptance Tests") at least ten (10) days before commencement of the Acceptance Tests. Buyer and Seller shall jointly commence the Acceptance Tests on the date specified in Seller's notice (or other mutually agreeable date) and a representative of Seller and a representative of Buyer shall sign off on the form provided as part of the test procedure whether each item of the test was passed or failed. If the Work does not fulfill the requirements of the Acceptance Tests, Seller shall correct the defects at no additional cost to Buyer as soon as practicable. Upon correction of the defects the Acceptance Tests for the applicable part of the Work shall be repeated in accordance with the procedures set forth in this Section. Successful completion of the Acceptance Test is the sole criterion for technical System Acceptance and the initiation of the Warranty Period. Final Acceptance shall occur when the Hardware and Software, Documentation Deliverables and Services have been furnished, delivered, installed and the Acceptance Tests have been passed.

(ii) As used in the Agreement, the term "Acceptance Date" shall mean and "Acceptance" of the Work shall be deemed to occur upon the earlier of: (1) the date on which the Work is deemed accepted pursuant to subsection (A) above, or (2) the date on which the Work is deemed accepted pursuant to subsection (B) above.

(iii) Buyer and Seller agree that in the process of completing the Acceptance Tests, most if not all of the Acceptance Tests can be successfully completed with only a minor number of punchlist items remaining to be completed. In such event, Buyer and Seller shall mutually (and reasonably) agree upon the punchlist items to be completed, the value of those items and that "Conditional Acceptance" of the Work has occurred. For the purpose of initiating the Warranty Period, satisfying the Project Schedule requirements and the release of any retained funds (other than the value of the punchlist items) conditional Acceptance shall constitute "Acceptance" of the specific portion or phase of the Work. Conditional Acceptance shall not, however, release Seller from its obligations to complete the remaining punchlist items by the dates set forth on the punchlist schedule.

N. SOFTWARE LICENSE:

Buyer is granted a license to use the Software only in conjunction with the Work purchased under this Agreement in accordance with the Software License Agreement made a part of the System Purchase Agreement, signed by the Buyer on December 7, 2010.

O. L3HARRIS MANUFACTURER'S WARRANTY:

(i) **Hardware and Services**

Seller warrants for the following periods of time from the Acceptance Date (hereinafter referred to as the "Warranty Period"), that the Hardware and installation Services furnished by Seller under this Agreement shall be free from defects in material and workmanship and shall conform to the Agreement specifications. Any Services provided during the Warranty Period are set forth in the Statement of Work. Any and all claims for breach of this warranty are conclusively deemed waived unless made within the Warranty Period.

a. for mobile and portable radios, twenty-four (24) months.
b. for all other Hardware, one (1) year.

For purposes of this Warranty the batteries supplied by Seller shall be deemed defective if: (1) the battery capacity is less than 80% of rated capacity, or (2) the battery develops leakage. Replacement batteries shall be warranted only for the remaining unexpired portion of the Warranty Period. This warranty becomes void if: (1) the battery has been subjected to any kind of misuse, detrimental exposure,

or has been involved in an accident, or (2) the battery is used in equipment or service other than the Hardware for which it is specified.

During the Warranty Period if any component of the Hardware or portion of the installation Services fails to meet the foregoing warranties, Seller's sole obligation and Buyer's exclusive remedy under this warranty shall be the correction by Seller of the failure. Seller shall, at Seller's sole option, (1) repair any defective component of the Hardware, or (2) furnish necessary repaired, refurbished, or replacement parts, or (3) correct the faulty installation. Seller will be responsible for all shipping charges incurred in returning defective parts to Seller's facility and the shipping charges to return repaired, refurbished, or replacement parts to Buyer. Any such repair or replacement of the defective component or the redoing of any installation shall not extend the Warranty Period. All warranty work must be at the Seller's place of business, for mobile or portable equipment, or at the Buyer's location for fixed location equipment. Where such failure cannot be corrected by Seller's commercially reasonable efforts, Seller will refund to Buyer the fees paid for the parts or Hardware less depreciation.

Any additional purchases of equipment, including radios, and installation services which may be purchased by Buyer and delivered or performed by Seller after System Acceptance, shall be warranted on the same terms, limitations, and exclusions as are set forth herein, except that the warranty on the equipment and installation services shall be for a period of two (2) years for additional Terminal Hardware items from the date of delivery of that item of equipment, one (1) year for additional Infrastructure Hardware items from the date of delivery of that item of equipment, and one (1) year from the date of completion of that installation service.

Seller's obligations shall not apply to: (1) Hardware or components thereof which are normally consumed in operation, or, or (2) defects which are the result of improper storage, use, or installation performed by other than Seller, maintenance performed by other than Seller, or repair performed by other than Seller, or (3) Hardware which has been subjected to any other kind of misuse or detrimental exposure or has been involved in an accident, or (4) Hardware or installations altered or repaired by any party other than Seller without Seller's prior written consent.

(ii) **Software**

The warranty for the Software is set forth in the Software License Agreement.

THE WARRANTIES AND REMEDIES SET FORTH IN THIS SECTION AND IN THE SOFTWARE LICENSE AGREEMENT CONSTITUTE THE ONLY WARRANTIES WITH RESPECT TO THE HARDWARE, SOFTWARE AND SERVICES AND THE BUYER'S EXCLUSIVE REMEDIES IN THE EVENT SUCH WARRANTIES ARE BREACHED. THEY ARE IN LIEU OF ALL OTHER WARRANTIES WHETHER WRITTEN, ORAL, EXPRESS, IMPLIED, OR STATUTORY INCLUDING, WITHOUT LIMITATION, THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, CONSEQUENTIAL OR INDIRECT DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES.

P. INTERFERENCE:

Radio System coverage and performance are subject to degradation or disruption due to anomalous propagation and interference by natural phenomena or other radio Systems ("Outside Interference"). Seller cannot be responsible for Outside Interference over which the Seller has no reasonable control. In the event of a case of degradation or disruption due to Outside Interference by natural phenomena

or an outside party, Seller will provide engineering support to Buyer at Buyer's expense to support Buyer's efforts in investigating and resolving the Outside Interference.

Q. PATENTS:

Seller warrants that the Work furnished hereunder shall be delivered free of any rightful claim of any third party for infringement of any United States patent or copyright. If Buyer notifies Seller promptly of the receipt of any claim that the Work infringes a United States patent or copyright and gives Seller information, assistance and exclusive authority to settle and defend such claim, Seller at its own expense shall defend, or may settle, any suit or proceeding against Buyer so far as based on a claimed infringement which breaches this warranty. If, in any such suit arising from such claim, the continued use of the Work for the purpose intended is enjoined by any court of competent jurisdiction, Seller shall, at its expense and option, either: (1) procure for Buyer the right to continue using the Work, or (2) modify the Work so that it becomes non-infringing, or (3) replace the Work or portions thereof so that it becomes non-infringing, or (4) remove the Work and refund the purchase price (less reasonable depreciation for use). The foregoing states the entire liability of Seller for patent or copyright infringement by the Work and is subject to any limitation of total liability set forth in this Agreement.

The preceding subsection (A) shall not apply to: (1) any portion of the Work which is manufactured to Buyer's design, or (2) the use of the Work in conjunction with any other apparatus or material not supplied by Seller to the extent that such conjoined use causes the alleged infringement. As to any portion of the Work or use described in the preceding sentence, Seller assumes no liability whatsoever for patent infringement.

THE PATENT AND COPYRIGHT WARRANTY AND INDEMNITY OBLIGATIONS RECITED ABOVE ARE IN LIEU OF ALL OTHER PATENT AND COPYRIGHT WARRANTIES AND INDEMNITIES WHATSOEVER, WHETHER ORAL, WRITTEN, EXPRESS, IMPLIED OR STATUTORY.

R. LIMITATION OF LIABILITY:

Except for Seller's liability to third parties for its willful misconduct or negligent acts or omissions as more particularly described in the Indemnification Section of this Agreement, the total liability of Seller, including its subcontractors or suppliers, for all claims of any kind for any loss or damage, whether in contract, warranty, tort (including negligence or infringement), strict liability or otherwise, arising out of, connected with, or resulting from the performance or non-performance of this Agreement or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Service, shall not exceed the amount paid by Buyer allocable to the particular item of Hardware, Software or Service which gives rise to the claim. Except as to title, any such liability shall terminate upon the expiration of the Warranty Period.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF AGREEMENT, WARRANTY, TORT (INCLUDING NEGLIGENCE OR INFRINGEMENT), STRICT LIABILITY OR OTHERWISE, SHALL SELLER, OR ITS SUBCONTRACTORS OR SUPPLIERS, BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, INDIRECT OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUES, LOSS OF USE OF THE HARDWARE OR ANY OTHER EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE GOODS, FACILITIES, SERVICES OR DOWNTIME COSTS.

Any action for any claim of any kind for any loss or damages arising out of, connected with, or resulting from the performance, non-performance or breach of the Agreement, or from the manufacture, sale, delivery, installation, technical direction of installation, resale, repair, replacement, licensing or use of any Hardware, Software or the furnishing of any Services, shall be commenced within one (1) year after the cause of action accrued or it shall be deemed waived or barred.

The provisions of this Section, LIMITATION OF LIABILITY, shall apply notwithstanding any other provisions of this Agreement or any other agreement. The provisions of this Section, LIMITATION OF LIABILITY, shall survive the expiration or termination of this Agreement.

S. REMEDIES:

Article 22 of the Sourcewell Contract **does not** apply to this Agreement.

In the event of a material breach of this Agreement by Seller which shall continue for ninety (90) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Seller by Buyer, Buyer shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity and either: (1) suspend performance of its payment obligations under the Agreement for as long as the breach continues uncorrected; or (2) terminate this Agreement by written notice to Seller if the breach remains uncorrected. The following shall constitute material breaches of this Agreement:

1. violation by Seller of any State, Federal or local law, or failure by Seller to comply with any applicable States and Federal service standards, as expressed by applicable statutes, rules and regulations.
2. failure by Seller to carry applicable licenses or certifications as required by law.
3. failure of Seller to comply with reporting requirements contained herein.
4. inability of Seller to perform the Work provided for herein.

In the event of: (1) any failure by Buyer for thirty (30) or more days to make any payment when due, or (2) any other material breach of this Agreement by Buyer which shall continue for ninety (90) or more days after written notice of such breach (including a reasonably detailed statement of the nature of such breach) shall have been given to Buyer by Seller, Seller shall be entitled to avail itself cumulatively of any and all remedies available at law or in equity and either: (1) suspend performance of its obligations under this Agreement for as long as the breach remains uncorrected; or (2) terminate this Agreement by written notice to Buyer if the breach remains uncorrected.

In the event of a termination under this Agreement as provided herein, all Services performed and finished and unfinished Hardware and Documentation Deliverables produced or made by Seller for Buyer, up to and including the date of termination, shall become the property of Buyer and Seller shall be entitled to receive full price accrued up to the point of termination, for any such Services performed and finished and unfinished Hardware and Documentation Deliverables. Notwithstanding the above, Seller shall not be relieved of liability to Buyer for damages sustained by Buyer by virtue of any breach of this Agreement by Seller described in subsection A above and, after providing Seller with written notice of breach as set forth in subsection A, Buyer may withhold any payments to Seller for the purpose of set-off of any damages, as agreed upon or finally adjudicated, against such payment.

T. SECTION 34. COOPERATIVE PURCHASING:

Purchases by Other Public Entities: This Agreement may be used by other public bodies to purchase infrastructure and related services, subscriber equipment and consoles on the pricing set forth in the Sourcewell Contract and in accordance with the terms, including applicable warranties, of this

Agreement unless otherwise specified herein. This pricing cannot be combined with any other promotional offers. Services are excluded from the discounts provided herein. Such public bodies shall place their own order(s) directly with Seller, and Seller shall deal directly with any public body Buyer approves to use the Agreement. The terms and conditions of this Agreement shall govern purchases by other public bodies unless they and the Seller agree to execute separate contracts. With the approval of the Seller, any public body using this Agreement may add terms and conditions required by statute, ordinances, or regulations. To the extent permitted by law, the parties may agree to additional or modified terms and conditions unique to the public body or as required by the circumstances surrounding the purchase. Buyer, its officials and employees, are not responsible for placement of orders, invoicing, payments, contractual disputes, or any other transactions between the Seller and any other public bodies. In no event shall Buyer, its officials or employees, be responsible for any costs, damages or injury resulting to any party from use of a Buyer contract. If, when preparing such a contract, the additional terms and conditions of a public body seeking to purchase pursuant to cooperative procurement are unacceptable to the Seller, the Seller may withdraw its consent to extension of the contract to that particular body. Buyer assumes no responsibility for any notification of the availability of this Agreement for use by other public bodies, but the Seller may carry out such notification.

U. ORDER OF PRECEDENCE:

The Statement of Work and the following documents and Exhibits are expressly incorporated into the Agreement by reference and, collectively, constitute the Agreement Documents. In the event of a conflict among or between the Agreement Documents, the documents shall control in the order of precedence in items 1-4 below:

1. Amendments to this Agreement
2. Articles 1 through 21 of the Sourcewell Contract #042021 (collectively, the "Sourcewell Contract") and these Additional Terms and Conditions (not including the Exhibits and documents listed below)
3. Detailed Design Documents
4. **Exhibit A** - Statement of Work, with Attachments

V. GOVERNING LAW:

It is expressly understood and agreed to by the parties hereto that in the event of any disagreement or controversy between the parties, California law shall be controlling. Venue for any legal proceedings shall be in any state or federal court in the State of California.

[*Signatures on Next Page*]

IN WITNESS WHEREOF, Buyer and Seller have executed this Contract.

BUYER

Monterey County
168 W. Alisal St. Fl. 2nd
Salinas, CA 93901-2438

DocuSigned by:
By: Eric Chatham
747D862C7BD04AE...

Name: Eric A. Chatham

Title: Chief Information Officer

Date: 9/25/2024 | 7:18 PM PDT

Signed by:
By: Sam Beiderwell
06A556AB2C9147D...

Name: Samuel B. Beiderwell

Title: Deputy County Counsel

Date: 9/25/2024 | 6:19 PM PDT

SELLER

L3Harris Technologies, Inc.
221 Jefferson Ridge Parkway
Lynchburg, VA 24501

DocuSigned by:
By:
655EF1D741C4428...

Name: Jeremy S. Roe

Title: Principal, Contracts

Date: September 13, 2024

EXHIBIT A

STATEMENT OF WORK

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Attachments to Exhibit A

SYSTEM DESCRIPTION

INTRODUCTION

L3Harris welcomes the opportunity to present a combined proposal for Monterey County and the City of Greenfield. The proposal includes an upgrade for Monterey County's existing VIDA SR10A.7 LMR system to VIDA SR11 and the addition of a new RF multisite for the City of Greenfield to enable them to be part of the Monterey County VIDA Network. The upgrade to SR11 and the RF site addition to the City of Greenfield will improve RF coverage and provide a greater range of security offerings.

The proposed offering will include an NSC replacement, Symphony console physical PC station replacement, network equipment replacement at the core and dispatch locations, as well as a new P25 Phase 2 capable, 700-MHz, 4-CH RF multisite with MASTR V base stations and a -48 DCV power plant to power the LMR equipment for City of Greenfield.

SYSTEM UPGRADE OFFERING

This proposal includes the following equipment and services:

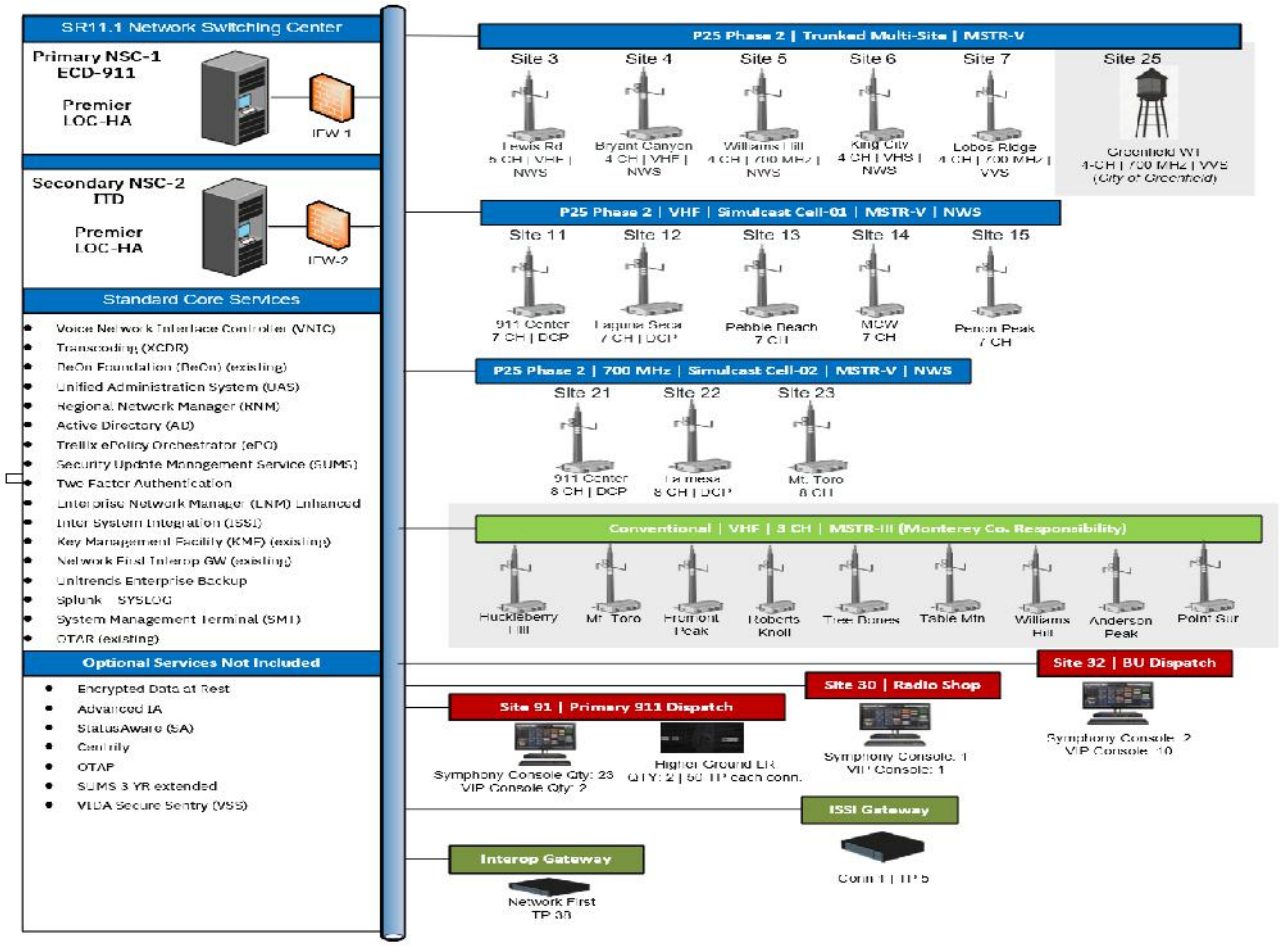
- Monterey County VIDA system:
  - Primary and Secondary VIDA Core replacement
  - Additional P25 site talkpath licenses for City of Greenfield RF site
  - Network equipment replacement at core, dispatch and radio shop
  - System Management Terminal (SMT) replacement
  - MASTR-V base station firmware upgrade
  - Network Sentry O/S upgrade
  - Symphony dispatch console physical PC replacement
  - Improved Cyber Security
- City of Greenfield RF multisite system:
  - P25 Phase 2 capable RF multisite with MASTR V base stations
  - VIDA Virtual Site (VVS) (environmental monitoring)
  - Tx/Rx antenna system
  - -48 VDC plant with 16 HRS of backup capacity
- List of equipment spares

System Implementation Services:

- Project Management
- Systems Engineering (staging & on-site)
- Installation
- Acceptance Testing
- As-Built Documentation

OVERVIEW OF SYSTEM FEATURES

Figure 1. Monterey County System Block Diagram



NSC SERVICES, & FUNCTIONALITY

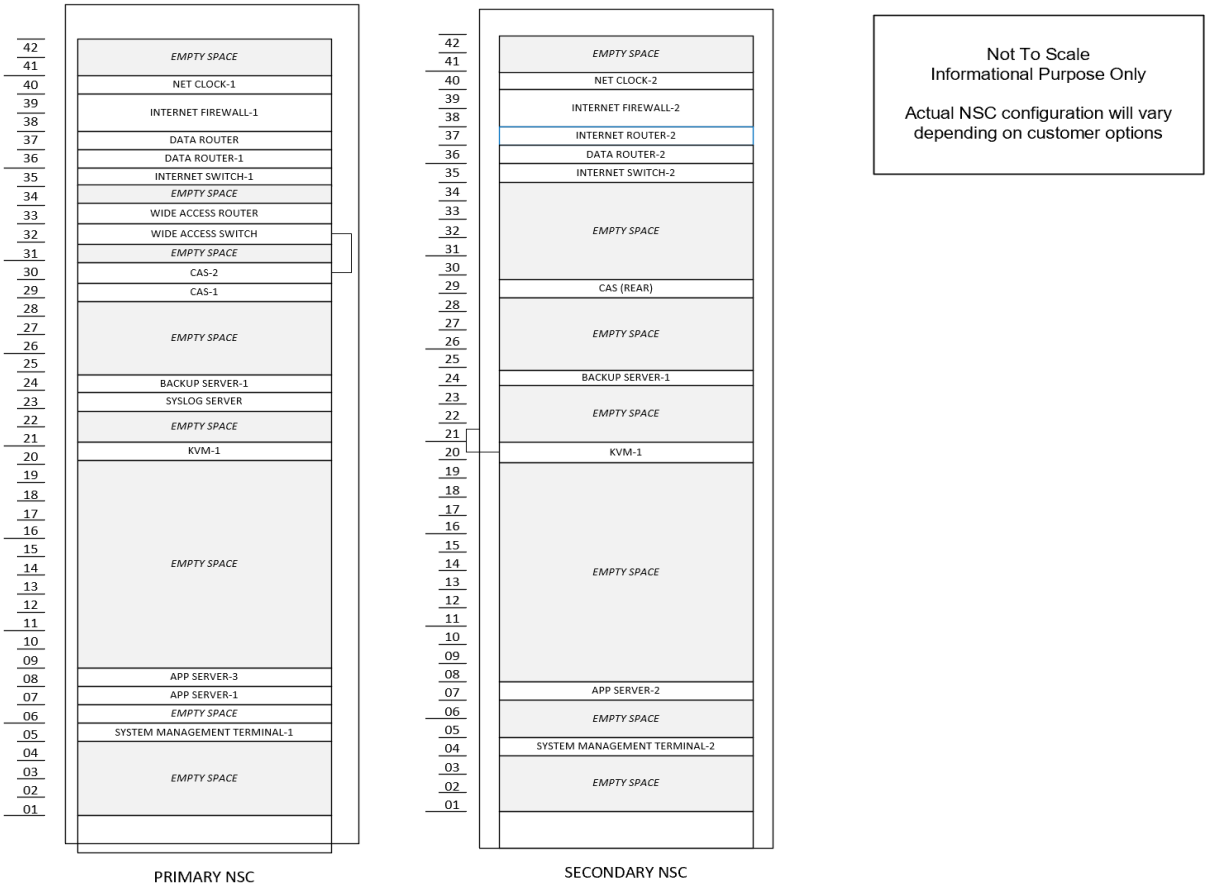
The following is a summary of services offered in this proposal:

SERVICES & FEATURES

Included Administration and Management Services:

- Network Switching Server (NSS)
- Unified Administration Server (UAS)
- Region Network Manager (RNM)
- Active Directory (AD)
- Security Update Management Service (SUMS)
- Transcoder (XCDA)
- Trellix ePolicy Orchestrator (ePO)
- BeOn Service
- Unitrends Enterprise Backup
- Syslog Service using SPLUNK
- Enterprise Network Manager (ENM): Enhanced ENM
- Key Management Facility (KMF)
- Network First Interoperability GW
- Over The Air Rekeying (OTAR)
- Two-Factor Authentication
- Voice Network Controller (VNIC)

Figure 2. Monterey County NSC Core Rack Diagram



PHASE 2 OPERATION DISCLAIMER

The SR11 upgrade by itself will not allow for P25 Phase 2 operation. To enable P25 Phase 2 functionality on the current radio fleet, Monterey County must perform the following tasks:

- Update the IDEN table for all radios currently in use
- Enable the Phase 2 mode of operation at the RF sites
- Modify the P25 Site Capability and Talk Group Detail parameters in the UAS

Without these updates, the existing radios will continue to operate only in Phase 1 mode regardless of the system's software release. For further details, please refer to the "Radio Cutover Plan" document included in the proposal as Appendix A.

CYBERSECURITY SOLUTION

As a world leader in cybersecurity, we have proven expertise in designing, implementing, and maintaining large state-of-the-art secure networks that meet the exacting demands of our government, transportation, and utility customers. The Monterey County system is secured using a defense-in-depth strategy, mitigating the risk of compromising any single defense. The current SR10A.7 system includes basic cybersecurity controls. With the SR11 upgrade, we are offering additional optional complementary components that comprise an enhanced layered defense strategy, as shown in Figure 3. These ensure Monterey County radio system users will have the confidence and trust the system maintains the confidentiality of their information, the integrity of their data, and the availability of their communications.

CURRENT CYBERSECURITY COMPONENTS

- Access Control
- Centralized User Management
- Malware Protection
- Host Intrusion Detection System (HIDS)
- Secure Remote Access
- Automated Patch Management
- Centralized Time Reference
- Disaster Recovery
- Secure Configurations
- Network Key Management Facility (KMF)
- Over The Air Rekeying (OTAR)

Figure 3. Layered Defense Strategy

Layered defense cybersecurity practices provide resilient LMR operations while minimizing failure and intrusions.

UPGRADED CYBERSECURITY COMPONENTS

- Secure Remote Access
- Network Intrusion Detection System (NIDS)
- P25 Link Layer Authentication
- Centralized Enterprise Backup (Unitrends)
- Centralized Log Management (Splunk)
- Two-Factor Authentication

CYBERSECURITY OPTIONS (NOT INCLUDED)

- Protection of Information in Transit
- Protection of Information at Rest
- Core Firewalls
- StatusAware (SA)
- Centrify
- VIDA Secure Sentry (VSS)

CURRENT CYBERSECURITY COMPONENTS

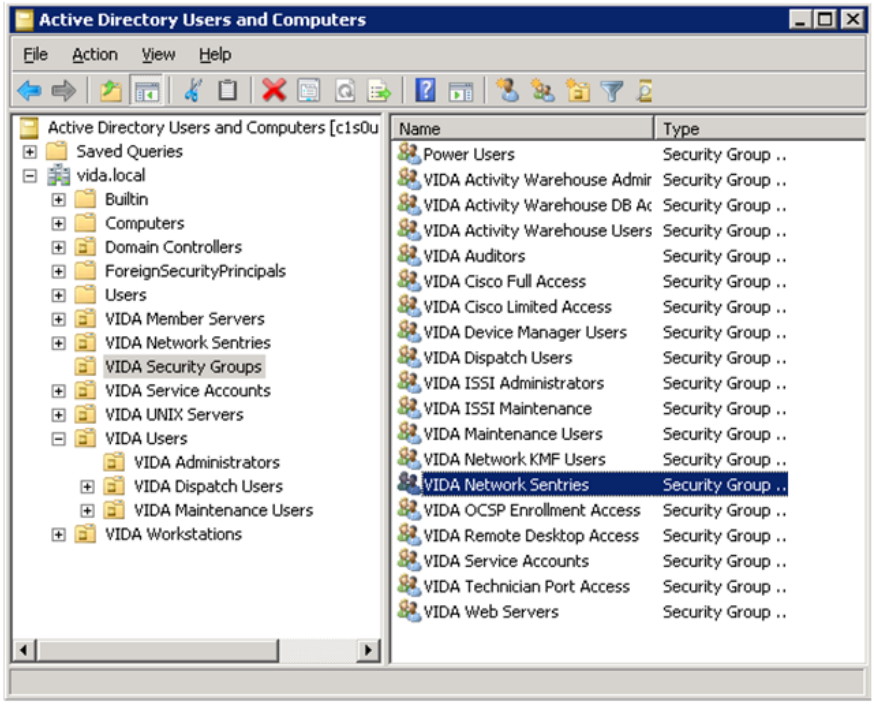
The following features are already components of the current SR10A.7 system and will transfer to SR11 system.

ACCESS CONTROL AND CENTRALIZED USER MANAGEMENT

Windows Active Directory (AD) controls access to the Monterey County radio network. This centralized service performs user and device authentication and authorization across the network, eliminating the need to manage individual user accounts on every device on the system. AD authentication is extended to UNIX servers with the integration of One Identity Authentication Services UNIX agents, and to networking devices (i.e. Cisco) through the remote authentication dial-in user service (RADIUS). Active Directory is hosted on redundant virtual servers on the VIDA Application Server (VAS) in the VIDA NSC to ensure service availability.

Active Directory security groups allow administrators to create role-based accounts to enforce the concept of “least privilege”. This provides users only the access necessary to complete their assigned tasks. Figure 4 shows examples of security groups and roles pre-configured in the Monterey County system Active Directory.

Figure 4. Active Directory Security Groups and Roles



MALWARE PROTECTION AND HOST INTRUSION DETECTION

Monterey County servers and workstations are protected by Trellix (formerly McAfee) Endpoint Security. Trellix Endpoint Security is an integrated security platform, combining antivirus, reputation, and heuristics with cutting-edge machine learning containment and host intrusion detection system (HIDS) functions in a single platform. It is centrally managed using Trellix's ePolicy Orchestrator® (ePO). ePO provides end-to-end visibility and automations that reduce incident response times and strengthen protection. The ePO server is a virtual machine running on the VIDA Application Server in the primary NSC. The ePO server is managed by accessing the secure ePO management web page from any system management terminal on the Monterey County radio network.

AUTOMATED PATCH MANAGEMENT

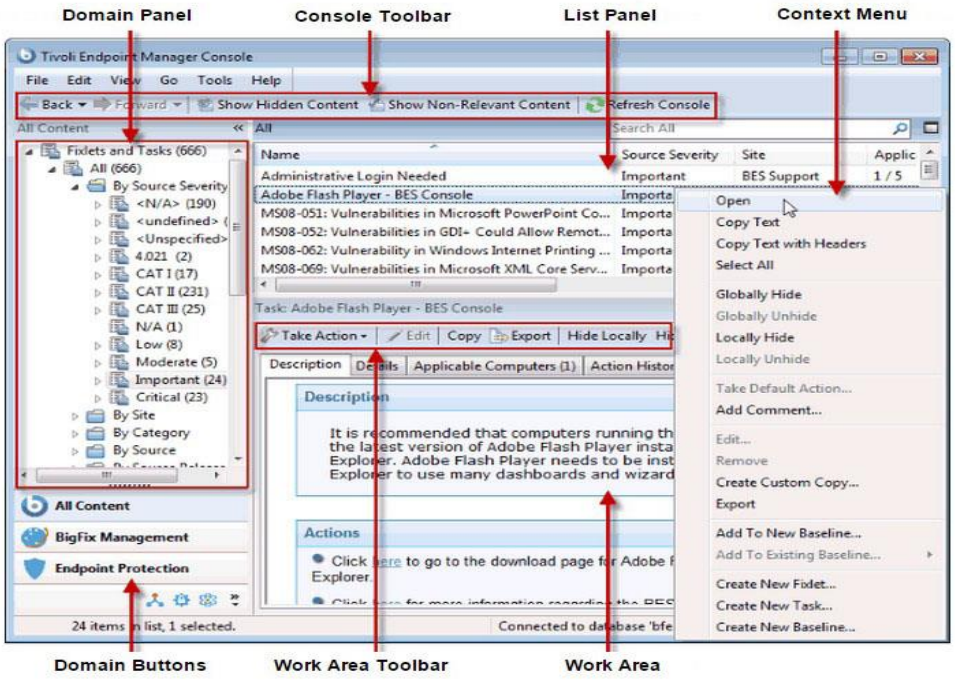
Security patch updates are managed by the Security Update Management Service (SUMS) Automation Server in the Network Switching Center (NSC). The SUMS Automation Server is one of the virtual machines running on the VIDA Application Server in the primary VIDA NSC.

Security patch updates are pre-validated and regularly provided through an optional subscription service from L3Harris called the Security Update Management Service (SUMS). Note: this proposal includes a one-year subscription to SUMS.

Monterey County radio system administrators start the automated distribution by loading the SUMS release media in the SUMS Automation Server using the SUMS Endpoint Manager Console. SUMS Agents loaded on each supported endpoint then pull the patches from the SUMS Automation Server. The administrator can pause, stop, or reverse the automated process as required.

Figure 5. SUMS Endpoint Manager Console

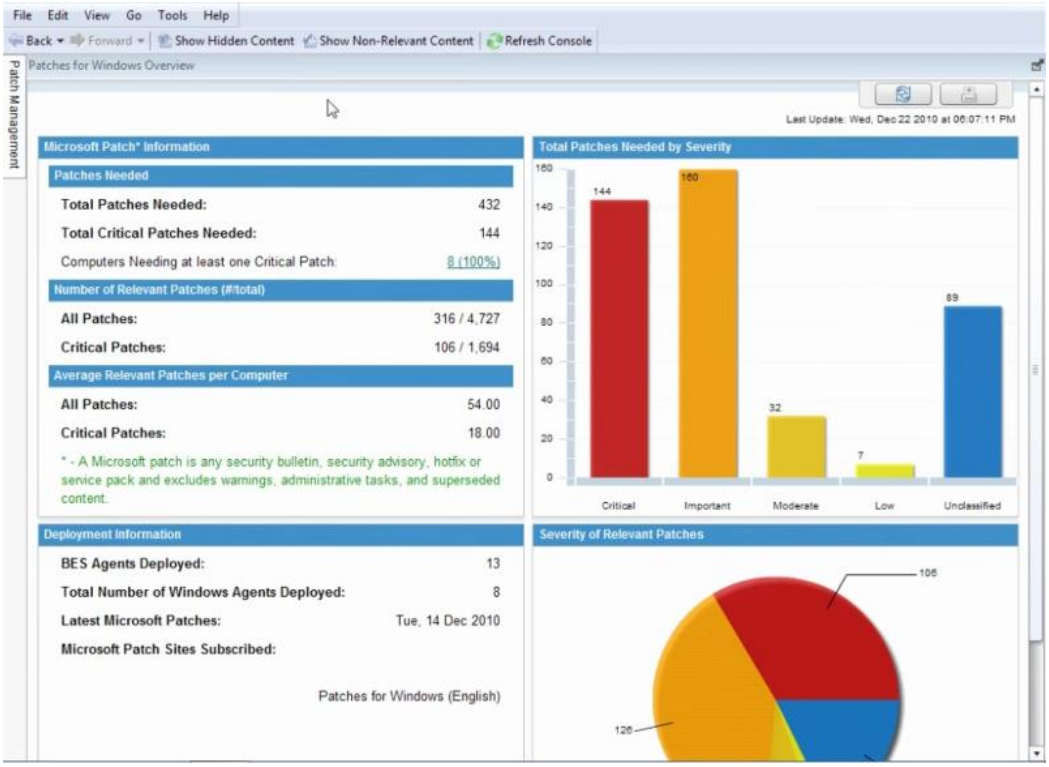
The SUMS Endpoint Manager Console allows centralized management of Monterey County system patch distribution



When Agents report patching is complete, the system administrator can schedule endpoint reboots from the SUMS Endpoint Manager Console at times convenient to users, minimizing impact to radio system. System administrators monitor and control the patch distribution process via the secure web-based SUMS Dashboard. The SUMS Dashboard is accessible by any authenticated administrator from any System Management Terminal on the Monterey County radio system network.

Figure 6. SUMS Dashboard

The SUMS Dashboard provides Monterey County system administrators patch reporting



NETWORK ISOLATION

The radio system network incorporates Virtual Local Area Networks (VLANs), which enable traffic separation and shaping of the network. In addition, they allow network implementation and optimization to proceed in a highly managed and controlled manner. Access Control Lists (ACLs) between VLANs isolate and partition trunked system traffic transport from other support network traffic. This ensures that a security breach in the support network equipment does not impact the dedicated capacity for call processing.

VLANs include:

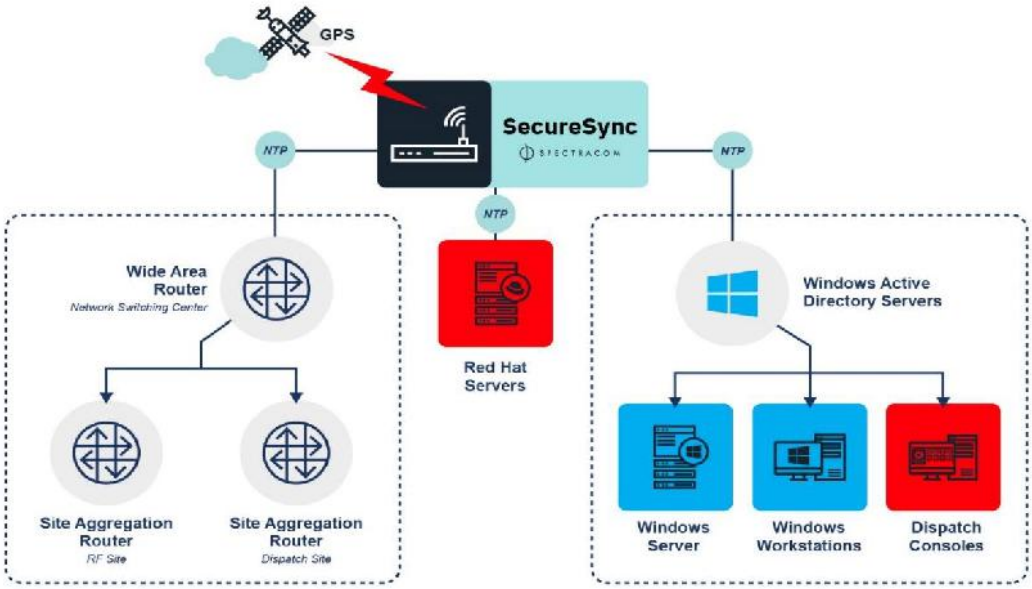
- Traffic VLAN, which handles all voice, data, and call signaling.
- Management VLAN, which supports administration and management servers
- Backbone management VLAN, which supports management of routers and switches and does not appear on any switch ports
- Security VLAN for firewall, Network Intrusion Detection & Prevention (IDS/IPS), management traffic, and centralized logging
- Remote management communications VLAN

- Loghost local VLAN, which provides communication between two Network Switching Servers (NSSs) in a high availability configuration
- Technician VLAN, which enables maintenance of the network
- Peripheral VLAN used to support customer-supplied equipment
- Bit bucket VLAN, which is the destination for nonradio system packets that enter the radio network

The VIDA system demarcation point is the IFW, therefore moving forward the VIDA network must now be routed through the customers IP network and firewalls to enable traffic separation and shaping of the network and allow network implementation and optimization to proceed in a highly managed and controlled manner. This ensures that a security breach in the support network equipment does not impact the dedicated capacity for call processing and to ensure that traffic is appropriately monitored for all required services per the Monterey standard policies.

CENTRALIZED TIME REFERENCE

A centralized time reference capability is critical to accurately synchronize system, log, and event recordings, facilitating data analysis and evaluation. The Monterey County system has Stratum-1 GPS-based Spectracom SecureSync® time reference systems installed in each NSC. The time reference in the active HA NSC serves as the time reference for the entire system. The NSC Wide Area Router (WAR) synchronizes directly from the SecureSync as its primary clock source. Windows Active Directory servers and Linux servers also obtain time directly from the SecureSync. All other Windows based devices obtain time from Active Directory. The Site Aggregation Routers (SAR) at the radio and dispatch sites synchronize time with the WAR. The Spectracom SecureSync in the inactive NSC is a secondary clock source so that the capability does not reduce even if one is completely lost.



SECURE CONFIGURATIONS

L3Harris hardens servers, workstations, and network routers with applicable security controls defined in the US Department of Defense Information Systems Agency Security Technical Implementation Guides (STIGs). The system efficiently achieves consistent and compliant configurations by utilizing Microsoft® Active Directory Group Policy Objects (GPO), SUMS and custom lockdown scripts for Linux machines, standalone Windows® platforms and internetwork equipment.

New policies and security guidance released since SR10A.7 are incorporated in the SR11 release.

Security controls include:

- Removing unnecessary services and programs
- Disabling unneeded communication ports and removable media drives
- Utilizing secured remote administration tools
- Enabling auditing of critical processes, directories, and actions
- Enforcing minimum authentication standards

DISASTER RECOVERY (BASELINE)

Security best-practice recommends backing up critical data using the “backup-in-depth” approach, with layers of backups (e.g., local, facility, disaster) time-sequenced so that rapid recent local backups are available for immediate use and secure backups are available to recover from a massive security incident. A mixture of backup/restore approaches and storage methods results in securely stored and appropriately accessible backups.

There are several backup strategies incorporated in the Monterey County radio system design that protect system data from partial or catastrophic malfunction at any of the system site or node.

DEVICE DATA

VIDA Device Manager is a Windows®-based application that facilitates the loading of code updates and personalities to many devices throughout the VIDA network. It maintains information in databases, facilitating the gathering of historical activities, validation checking, and the secure storage of data. As personalities populate in the VIDA Device Manager, the Repository automatically creates historical versions to easily track and compare them. The Repository maintains a history of activities performed upon devices, personalities, and code instances. History viewers facilitate browsing activities per device, personality, code instance, or all events within a specific time period.

VIDA Device Manager and its associated database repository resides on a virtual system running on the VIDA Applications Server where, ideally, it is archived by the optional enterprise backup solution.

VIRTUAL SYSTEM STATE

The VIDA Application Server uses snapshot imaging to capture state, data, and hardware configurations of a running virtual machines. Snapshots, taken manually, provide a fast and easy way to revert the virtual machine to a previous state. Having an easy way to revert a virtual machine can be very useful the system administrators need to recreate a specific state or condition to troubleshoot a problem. This is particularly useful when upgrading software or diagnosing a problem.

REPLICATION

For networks configured for Location HA, vSphere Replication provides a storage-agnostic and workload-agnostic solution that periodically, and asynchronously replicates over the IP-based network, typically to a remote site for disaster recovery.

CENTRALIZED ENTERPRISE BACKUP

Unitrends Recovery-Series Disk-to-Disk Backup Appliances are available as an option for centralized enterprise data backup. See the Cybersecurity Options section for more information on this service.

KEY MANAGEMENT FACILITY (KMF)

The Key Management Facility (KMF) server will be upgraded during the SR11 update. The KMF is a network server-based application used to manage large fleets of crypto nets. It is a P25^{IP} network product that works in conjunction with the network to provide complete key management of all network devices, including subscriber devices. The KMF consists of a network server that generates key sets and sends Over-the-Air Rekeying (OTAR) messages to encryption devices. Multiple KMFs can exist on the same P25^{IP} network; this allows different agencies sharing a single integrated network to control their own assets.

A secure HTML web browser on the P25^{IP} Unified Administration System (UAS) provides the user interface to the KMF. From the UAS, crypto officers provide keying information to agency radios located anywhere on the network. The UAS has a partitioned database with multiple levels of access so multiple agencies can share a single KMF. The partitioned database also allows agencies to restrict OTAR or other sensitive information to limited personnel. The KMF tightly couples to the UAS fleetmap structure, seamlessly binding key sets to users and talkgroups.

Because of the scope and capacity of the Network KMF server, a single KMF can support the OTAR needs of 10,000+ users across a nationwide network.

OVER-THE-AIR REKEYING (OTAR)

The L3Harris P25 Key Management System for OTAR provides a secure framework for encryption key generation and distribution within the proposed network of P25 devices using the PMIPS architecture. Key management becomes more complex as the number of encrypted units increases. L3Harris offers a key management solution to meet the requirements for a large network of radios, dispatch consoles, and Crypto Nets, which network-based key management servers will effectively manage using encrypted over-the-air transport of keys to fielded radios and

network devices. The L3Harris P25 Key Management System provides mechanisms for key generation, storage, transport, and key loading. Key generation occurs either automatically by the KMF, or manually by entering in a known key. The KMF database stores the keys.

Encrypted Over-the-Air Rekeying (OTAR) formats securely transport radio network keys. Loading keys into the target devices occurs either through a direct cable connection to a PC or through encrypted OTAR messages transmitted across the network (IP) connection.

ALARM MANAGEMENT

L3Harris assumes site & shelter alarms are existing and already connected to a standard Type 66 punch block, or equivalent connection block, which will serve as the point of demarcation.

Monterrey Counties existing standard alarm management plan will remain in effect and will be reused with SR11.1.

Upgraded Cybersecurity Components

The features below are included in this base proposal for the SR11 system upgrade.

REMOTE ACCESS FIREWALLS

The existing Cisco Adaptive Security Appliance Internet Firewalls (IFWs) will be upgraded to Cisco Firepower firewalls running ASA software. IFWs secure communications external to the Monterey County network, specifically supporting Inter-Sub System Interface (ISSI) connections, BeOn and remote access. They monitor and control all communications at the external boundary of the system.

The firewalls and firewall policies are configured in accordance with the general industry practices. For example:

- All communications, with the exception of specifically enabled communications between devices on the unprotected LAN and protected networks, is blocked. Blocking is based on source and destination IP address pairs, services, and ports. Blocking occur on both inbound and outbound packets, which is helpful in limiting high-risk communications
- Information flow for traffic monitoring, analysis, and intrusion detection is logged
- Logs can be forwarded to a centralized logging server
- The base rule set is deny all, permit none.

Monterey County authorized employees and contractors will continue to access internal radio system network resources using the Cisco AnyConnect Secure Mobility Client. Connecting via AnyConnect requires authentication with valid radio system Active Directory credentials. Authentication is enhanced with addition of the two-factor authentication solution described below. Once connected, SSL or IPsec IKEv2 encryption secures all traffic, and the firewall and network intrusion detection system inspect all traffic.

TWO-FACTOR AUTHENTICATION

Two-factor authentication is included to protect remote access via VPN through the Internet Firewall. Using two-factor authentication minimizes risks associated with compromised credentials and identity impersonation. One Identity™ Defender® tokens integrate with Active Directory, taking advantage of the user identity already in place. User token assignment is simply an additional attribute of a user's properties within Active Directory.

P25 LINK LAYER AUTHENTICATION

Link Layer Authentication (LLA) is the method defined in the P25 standards to prevent unauthorized radios on the radio network. It is based on a "challenge and response" authentication method to verify the identity or legitimacy of a radio and to validate the radio network. The P25^{IP} system uses unit authentication to verify whether a radio is a valid unit authorized to operate on this system. The P25^{IP} system also uses mutual authentication to enable an authorized radio to validate the radio network. This prevents a rogue RF site from capturing the radio registration credentials.

When a radio requests access to the system, the radio network sends a challenge message to it. The radio returns a response that requires knowledge of the authentication key. The radio can also authenticate the radio network by making authentication mutual: it sends a challenge message to the radio network. In return, the radio network sends a response that requires knowledge of the same authentication key.

The P25 standards committees developed P25 LLA to increase the security of P25 networks and prevent unauthorized radio registration.

- When a P25 user radio registers on a site, it checks the LLA system-wide and per-user radio unit policy. If enabled for LLA, the system attempts to authenticate the user radio. The site receives authentication messages from the radio. After translating the messages, the site sends them to the NSC. If the authentication succeeds, only then is the radio allowed to register. Otherwise, authentication failure prevents the radio registration.
- An outsider may succeed in programming an invalid radio with system information and stealing valid radio IDs and groups. However, he or she will not be able to register on the system because the rogue radio will be unable to answer the challenge with a valid authentication key.

Also, a P25 radio can challenge the system for mutual authentication. The P25 standards committees added this feature at the request of the federal government. It prevents radios from logging into a fake P25 system (system spoofing) by having the radio challenge the system prior to registering.

As part of a full registration, the P25 radio performs registration authentication. The network management system can also demand radio authentication.

CENTRALIZED LOG MANAGEMENT

A centralized log manager facilitates the collection and review of system log data from all enterprise components. This device integrates the collection, normalization, and indexing of log

information. Creating a centralized database of system event logs from all network devices simplifies the analysis of network security issues. This results in a faster response by network personnel.

Industry-standard Splunk Enterprise is a highly recommended option to provide centralized log management. It collects logs sent by the Spunk Universal Forwarder installed on UNIX and Windows devices, and logs sent by Cisco firewalls, routers, and switches by their native Syslog utility. It automates the collection, indexing and alerting of critical machine data, providing an analytics-driven solution, allowing your administrators to monitor threats in real time and respond quickly to incidents, so that they can avoid or limit damage.

CENTRALIZED ENTERPRISE BACKUP

Unitrends Recovery-Series Disk-to-Disk Backup Appliances are a highly recommended option to provide centralized backup of enterprise data. Installed in each VIDA NSC, Unitrends Backup Appliances back up system data, and copy data to drives suitable for secure off-site storage. Each appliance supports up to 6 TB raw backup data.

Figure 7. Unitrends Disk Backup Appliances

Unitrends is an affordable, easy-to-use data protection solution.

The local Backup Appliance backs up critical data on the VIDA Application Server using VMware's Storage APIs for Data Protection (VADP). VADP enables Unitrends to do centralized, efficient, off-host backup of vSphere virtual machines stored on the storage system. Using VADP, the Unitrends appliance backs up the vSphere virtual machines without requiring backup agents or requiring backup processing on each guest virtual machine on the VAS. VADP leverages the snapshot capabilities of VMware vSphere to enable backup across the network without requiring downtime for virtual machines. As a result, backups can be performed non-disruptively at any time of the day without requiring extended backup windows or downtime to applications.

The data backed up on the VAS includes the Unified Administration Server database, Active Directory backups, system configuration parameters from Device Manager, radio system utilization history from the Regional Network Manager and Regional Site Manager, the KMF database, Cisco, and VMware's ESXi hypervisor configurations.

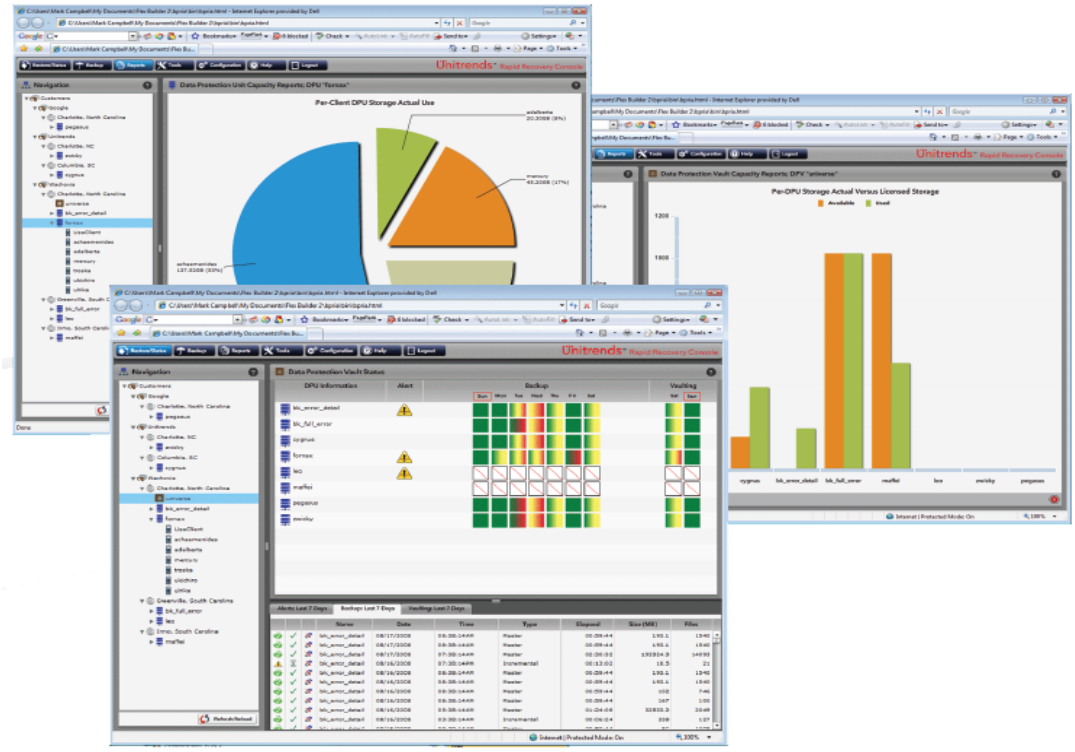
Unitrends "de-duplicates" the data for storage efficiency (ensures that only one copy of duplicate data is stored). Unitrends automatically performs standards-based AES 256-bit encryption, protecting data from unauthorized access and theft, and stores the data on a redundant array of independent disks. This method provides availability, reliability, and speedy access. Once stored on the Unitrends appliance the data is available for rapid system restoration. Data can also be

copied from the local Unitrends to a second set of blank drives, which are removable to allow secure offsite storage.

System administrators centrally monitor and manage Unitrends backup and recovery using the secure, web-based Rapid Recovery Console. In the event of loss of equipment data, administrators use the Rapid Recovery Console to restore the data and configuration to get the network device operating again. The Rapid Recovery Console is accessible by any authenticated administrator from any System Management Terminal on the Monterey County radio network.

Figure 8. Unitrends Rapid Recovery Console

The Unitrends Rapid Recovery Console is the single interface to manage backups throughout the Monterey County radio network



Cybersecurity Options

The features below are OPTIONAL priced options that are not included in this base proposal but can be added to the SR11 system upgrade.

SECURITY UPDATE MANAGEMENT SERVICE (SUMS)

SUMS is an optional L3Harris subscription service that provides regularly scheduled, pre-validated security patch updates. This feature has been added to this proposal as an OPTIONAL service.

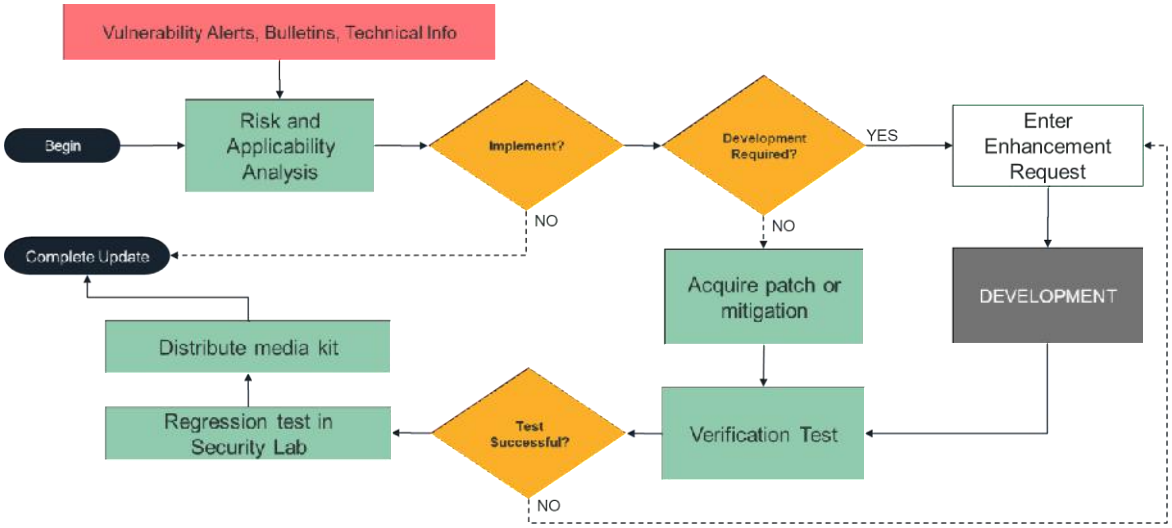
SUMS solves the problem of testing patches and deploying reliable updates to server and workstation operating systems (Windows, Red Hat Enterprise Linux). L3Harris monitors security alerts, bulletins, advisories, and directives from credible external organizations. These include information assurance vulnerability alerts (IAVAs), operating system patches and antivirus updates from Original Equipment Manufacturers (OEMs), industry, and US Government sources.

A ONE-YEAR SUBSCRIPTION TO SUMS IS INCLUDED IN THIS PROPOSAL.

Once obtained, L3Harris verifies the patches to confirm they are unaltered and thoroughly evaluates these patches in our dedicated SUMS laboratory for quality assurance and to confirm they do not adversely affect radio system usability.

Figure 9. Software Update Management Service Process

L3Harris' SUMS process tests patches before deployment to critical communications systems.



We distribute applicable and usable patches in a release every 60 days throughout the lifecycle of the system, as long as you maintain the SUMS subscription. Monterey County radio system administrators will have access to the releases via network download or mailed media. Releases include the distribution media, the release notes documenting the contents of the release, and the detailed installation instructions.

Should any evaluation between regular updates reveal high priority vulnerability (such as a significant virus or denial of service attack), L3Harris will release supplemental updates between regular cycles. Just like standard releases, emergency releases are available via Tech-Link downloads and mailed media. Additionally, the next available standard release includes any previous emergency releases.

NSC CORE FIREWALLS

Cisco Firepower Regional Firewalls (RFWs) can be added to secure the internal enclave boundaries encompassing the Primary and Secondary VIDA NSC Cores. They restrict unauthorized

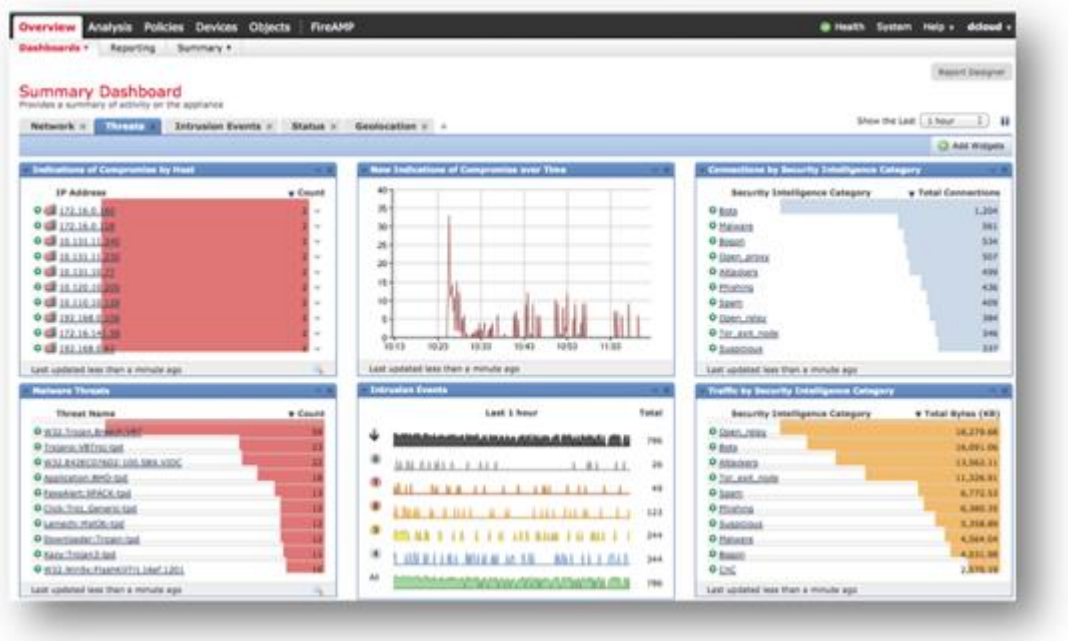
network access, detect, prevent, and respond to network attacks, enforce policies, and integrate high-performance security features such as state awareness and application filtering. RFWs are also centrally managed by the Cisco Secure Firewall Management Center (FMC).

The Cisco Firepower firewalls also provide network intrusion detection system (NIDS) services in each of the VIDA NSC Cores, monitoring all network traffic, including local network traffic not routed outside of the NSC. Alerts are sent to the Secure Firewall Management Center (FMC), where they are managed as described in the Internet Firewall section.

NETWORK INTRUSION DETECTION SYSTEM

Network intrusion detection system (NIDS) services are available for the Monterey County system as an option. NIDS sensors running Cisco Firepower Threat Defense software will inspect general network traffic, monitoring all network traffic in each of the VIDA NSC Cores, including local network traffic not being routed outside of the NSC. When the Firepower Threat Defense software detects a pattern of communications associated with a network intrusion, it generates an intrusion event. The event is sent to the Secure Firewall Management Center (FMC) in the primary NSC Core, which logs it in a database, displays an alert on the FMC dashboard and issues an alert to Monterey County personnel. Monterey County incident response personnel can review intrusion events to determine whether they threaten the network, and either address or mark the event as reviewed.

Figure 10. Cisco Firewall Management Center Dashboard



PROTECTION OF INFORMATION IN TRANSIT

As an option, Monterey County may choose to leverage the advanced security operating system running on the Cisco Integrated Service Routers to provide link encryption. Link encryption enables complete encryption of information traversing the network through public, shared, or

insecure physical media, mitigating the risk of providing information about network infrastructure, user behavior, or confidential information to unauthorized sources. All system and network management activity use secure protocols for client-to-server communications.

PROTECTION OF INFOMATION AT REST

To maintain the confidentiality and integrity protection of information at rest, the virtual Storage Area Network (SAN) solution, StorMagic, can implement optional AES-256 encryption. A virtual appliance from HyTrust called Key Control acts as the key manager for the StorMagic volumes.

ADVANCED INFORMATION ASSURANCE

As an option, all switch ports can be configured with 802.1X authentication or MAC address filtering by implementing Cisco Port Security, with dynamically learned sticky MAC addresses. To secure RF sites and dispatch centers, the routers at these locations can incorporate Zone-Based Firewall (ZBFW) support to provide a comprehensive end-point firewall.

STATUSAWARE: GPS LOCATION REPORTING FOR MAPPING APPLICATIONS

StatusAware Service (SA-Svc) is an advanced feature that consists of a virtual machine (VM) running on the L3Harris VIDA Network Switching Center (NSC). The StatusAware Service provides a single interface for collecting location (GPS data) and status (Presence data) information from devices such as P25 radios and L3Harris BeOn clients. L3Harris calls these devices “Presentities.” Presence information can include data such as unit availability, permissions, capabilities, and affiliations (e.g., talkgroup, site, etc.).

StatusAware can then send this information to other internal or external applications such as Automatic Vehicle Location (AVL) applications or Computer Aided Dispatch (CAD) systems for display. L3Harris calls these applications “Watchers.” Visual representation of GPS location and Presence data greatly enhances the ability to respond to crisis incidents and operational changes.

StatusAware Manages:

- Tier 2 Location Request: Tier 2 Location Request is a TIA P25 standards-based feature that requires a working channel using a voice communications talkpath to make the data transmission.
- Binary Efficient Location Reporting (BELR): BELR messaging is similar to Tier 2 GPS in that it requires a working channel using a voice communications talkpath to make the data transmission. However, BELR streamlines GPS data exchanges into a single outbound P25-GLR message, and a single inbound P25-GLP message for more efficient use of system resources. This feature increases efficiency over standard Tier 2 functionality and is proprietary to L3Harris.
- In-Band GPS: In-Band GPS transmits GPS data without disruption while also transmitting voice communication with no additional working channel required. This proprietary L3Harris feature provides the most efficient use of system resources while also supporting location services.

ALARM MANAGEMENT

L3Harris assumes site & shelter alarms are existing and already connected to a standard Type 66 punch block, or equivalent connection block, which will serve as the point of demarcation.

Monterrey Counties existing standard alarm management plan will remain in effect and will be reused with SR11.1.

SESSION AUDITING (CENTRIFY)

To meet requirements for user session auditing, L3Harris offers an option for authorized users to select a user session and capture or view that session. This product, Centrify, is implemented as a virtual machine within the NSC. A Centrify client is installed on each System Management Terminal and VIDA Management Terminal on the system, which records all user actions and sends them to the Centrify server in the NSC.

Figure 11. Session Auditing

Centrify identities against cyberthreats that target today's hybrid IT environments. Detect suspicious user activity to alert in real time of attacks that may be in progress. Monitor and control privileged sessions that leverage shared and individual accounts.

VIDA SECURE SENTRY (VSS)

VIDA Secure Sentry (VSS) provides policy and third-party vendor supplied security patches to further enhance the security of your VIDA system. As cybersecurity attacks such as viruses, malware, ransomware, and denial of service increase annually and impact all levels of government and businesses, maintaining your VIDA system's security posture is essential to the availability of your critical communications system.

VSS releases occur quarterly and are based on the applicable, publicly available US Government's National Institute of Standards and Technology's (NIST) guidelines for assessments, framework, controls, policy, and procedures. Security Technical Implementation Guides (STIGs) are a collection of recommended settings and controls. L3Harris applies the STIG guidance and tests updates on the VIDA system to confirm compatibility with its applications prior to making the VSS

release. Governing bodies for public safety, utilities, and the federal government have all adopted the NIST framework to maintain a high level of security for their communication systems.

L3Harris will coordinate with you to determine an appropriate time for cybersecurity technicians to come onsite to install the VSS updates. VSS is only applicable for SR11.1 hardware and above.

Scope of Work

L3Harris will provide the following scope of services to upgrade Monterey County's system to SR11 and install the new RF site for the City of Greenfield

- System Engineering
- Project Management
- Installation Services
- Staging & Shipping
- Acceptance Testing

Upon contract execution, L3Harris will build and configure the new equipment with standard L3Harris configuration. After successful staging and testing, L3Harris will ship the equipment to the appropriate Monterey County site for installation into the designated equipment room or shelter.

The L3Harris team will power up the new equipment and perform a system health audit to verify proper installation and function of the new equipment. The L3Harris Team will then configure the new equipment and prepare the system for cutover and acceptance testing.

BACKHAUL

It is the responsibility of Monterey County to provide backhaul connectivity for an adequate MPLS network, capable of supporting the full scope of the requested upgrade and grade of service required.

BANDWIDTH

The table below identifies the total calculated bandwidth for the Monterey County system. Based on anticipated usage and current system features purchased with the SR11 platform.

Figure 12. Bandwidth Requirements

System Name	Type	RF Channels	Talkpaths	Total Talkpaths	Symphony Consoles	Number of Sites	BW per Symphony (kbps)	VNIC Aggregated Traffic (kbps)	Aggregated Layer 2 Ring BW (kbps)	Minimum Recommended Ring Requirement (kbps)
7-Channel DCP 1	DCP Simulcast	7	12	12		5		686	2,939	5,878
4-Channel DCP 2	DCP Simulcast	8	14	14		3		592	1,844	3,688
4-Channel Multisite	Multisite	4	6	24		4		216	864	1,728
5-Channel Multisite	Multisite	5	8	8		1		254	254	508
4-Channel Multisite (Greenfield WT)	Multisite	4	6	6		1		216	216	432
Logging Recorder (existing)	Dispatch			98		1		7013	7,013	14,026
I/O Gateway (existing)	Interoperability		20	40		2		1760	1,760	3,520
ISSI Gateway	Interoperability		5	5		1		197	591	1,182
Dispatch Consoles	Dispatch		12	384	23	1	514	16,448	16,448	32,896
Aggregation Bandwidth Total								**27382**	**31929**	**63858**

NETWORK UPGRADE

L3Harris is providing the following scope of services to upgrade a portion of Monterey County's network system:

- Replace existing End of Support (EOS) routers and switches at core, dispatch and radio shop.
- Install a County-provided MPLS V2 router at the Pebble Beach RF site.
- Upgrade Bryant / KCAG / Williams Hill / multisites from T1 to County-provided Ethernet backhaul.
- Upgrade Network Sentrys to Windows 10, where applicable.
- Configure 1 port on each core router on primary and secondary NSC for connection to the City of Greenfield Site Router. Monterey County will provide L2 backhaul from the City of Greenfield RF site to each NSC's MPLS router.

CORE UPGRADE

L3Harris will replace existing NSC cores with new SR11 Primary and Secondary NSC cores, respectively. These are VIDA Premier Location-HA NSC, geographically separated. The new SR11 NSCs will include new routers, switches, and firewalls.

L3Harris will leverage the existing Monterey network infrastructure and reuse valid L3Harris licenses across the system. Engineering services are included on-site for power-up, final configuration, equipment transition, and functional testing (ATP).

LOGGING RECORDER

L3Harris will transfer internal licensing on the NSC for the logging recorder IP ports. Configuring and/or providing any necessary upgrades to interface the logging recorder is out-of-scope for this

proposal. It will be the responsibility of the County to work with Higher Ground to ensure the current LR release is compatible with SR11 S/W.

ALARM MANAGEMENT

VIDA VIRTUAL SITE (VVS)

L3Harris provides VIDA Virtual Site alarm and control system for each VIDA-connected RF site. Management Services as part of L3Harris' total Network Management System. It provides a full array of digital communications capabilities for fast, accurate, and efficient relay of critical information.

The VIDA Virtual Site translates hardwired alarm inputs into network portable alarm messages that the VVS fault monitoring service can convey to the Network Management System. The VIDA Virtual Site can be custom configured for the City of Greenfield with an array of analog or digital inputs, such as tower beacons, doors, temperature alarms, etc. that require monitoring. The VVS also supports digital output adapters which can remotely control the relay logic devices to open doors, start generators, or other remote site management needs.

The VIDA Virtual Site standard configuration provided includes the following capacity:

- Active Low Digital Inputs: Capacity Qty (48), Connected Qty (10), Spare (6)
- Active High Digital Inputs: Capacity Qty (8), Connected Qty (0), Spare (8)
- Active High Digital Outputs: Capacity Qty (8), Connected Qty (0), Spare (8)

By default, L3 Harris will "connect" 32 External and 10 Internal Digital Inputs and no (zero) Digital Outputs. Alarm plan can be modified at the City of Greenfield's request at any time prior to final system acceptance.

L3Harris will use the shelter infrastructure for the VIDA Virtual Site (VVS) to implement L3Harris Standard Alarm Plan. L3Harris will provide new punch blocks, as required, and alarm wiring to support hardwired alarm connections for new L3Harris provided LMR equipment per the alarm connection details in this plan.

Alarm Plan Requirements for Customer Provided Greenfield Shelter

City of Greenfield will provide a 4' x 4' wall mounted Telco/alarm board provided for mounting punch blocks and future ancillary equipment.

City of Greenfield will provide and install Qty (4) Standard Type-66 Punch Blocks, Siemon S66M1-50, or equivalent, mounted in accordance with connection details provided in this plan.

City of Greenfield is responsible for wiring shelter alarms to a Type 66 block(s) on the Telco/alarm board in accordance with connection details provided in this plan.

City of Greenfield is responsible for wiring equipment alarms for new equipment they provide, such as generators or backup power systems, to a Type 66 block(s) on the Telco/alarm board in accordance with connection details provided in this plan.

L3Harris is responsible for equipment alarms for new equipment they provide, such as LMR or backup power systems. L3Harris will cross-connect City of Greenfield connected shelter alarms to L3Harris provided VVS MOXA block.

City of Greenfield will incorporate surge protection, in accordance with L3Harris' Site Grounding and Lightning Protection Guidelines AE/LZT 123 4618/1, for alarm lines entering or exiting the shelter and connecting to L3Harris furnished equipment.

For all Monterey County's existing RF sites, L3Harris assumes site & shelter alarms are existing and already connected to a standard Type 66 punch block, or equivalent connection block, which will serve as the point of demarcation. Monterrey Counties existing standard alarm management plan will remain in effect and will be reused with SR11

EQUIPMENT UPGRADES/INSTALLS BY LOCATION

The proposed SR11 system upgrade includes the following sites and equipment.

NSC 1: Primary Core – 911 ECD

- Replacement of Primary NSC hardware platform including:
  - VIDA Application Servers
  - Unitrends backup server
  - SYSLOG Splunk VM server
  - System Management Terminals
- Networking equipment including:
  - Internet firewall (IFW)
  - Routers
  - Switches

NSC 2: Secondary Core – ITD

- Replacement of Secondary NSC hardware platform including:
  - VIDA Application Server
  - Unitrends backup server
  - System Management Terminals
- Networking equipment including:
  - Internet firewall (IFW)
  - Routers
  - Switches

SITE 3: MULTISITE – LEWIS RD (5-CH, VHF)

- MASTR V base stations firmware upgrades

- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 4: MULTISITE – BRYANT CANYON (4-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10
- Upgrade existing T1 backhaul to County-provided Ethernet backhaul

SITE 5: MULTISITE – WILLIAMS HILL (4-CH, 700 MHZ)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10
- Upgrade existing T1 backhaul to County-provided Ethernet backhaul

SITE 6: MULTISITE – KING CITY (4-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10
- Upgrade existing T1 backhaul to County-provided Ethernet backhaul

SITE 7: MULTISITE – LOBOS RIDGE (4-CH, 700 MHZ)

- MASTR V base stations firmware upgrades

SITE 11: SIMULCAST CELL 1 – 911 CENTER (7-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 12: SIMULCAST CELL 1 – LAGUNA SECA (7-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 13: SIMULCAST CELL 1 – PEBBLE BEACH (7-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10
- MPLS V2 router (County provided)

SITE 14: SIMULCAST CELL 1 – MCW (7-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 15: SIMULCAST CELL 1 – PENON PEAK (7-CH, VHF)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 21: SIMULCAST CELL 2 – 911 CENTER (8-CH, 700 MHZ)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 22: SIMULCAST CELL 2 – LA MESA (8-CH, 700 MHZ)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

SITE 23: SIMULCAST CELL 2 – MT TORO (8-CH, 700 MHZ)

- MASTR V base stations firmware upgrades
- Network Sentry (NWS) O/S upgrade to Windows 10

ECD: 911 PRIMARY DISPATCH CENTER

- Symphony IP Dispatch Consoles:
  - Replacement of the Symphony Dispatch PC hardware, including:
    - Symphony Dispatch Platform (3.0)
    - Upgrade O/S to Windows 11
    - Refresh Premier console image for SR11
    - Existing licenses will be transferred
- VIP console image refresh
- Network Equipment
  - Routers
  - Switches

RS: RADIO SHOP – MONTEREY COUNTY

- Symphony IP Dispatch Consoles:
  - Replacement of the Symphony Dispatch PC hardware, including:
    - Symphony Dispatch Platform (3.0)
    - Upgrade O/S to Windows 11
    - Refresh premier console image for SR11

  - Existing licenses will be transferred
- System Management Terminals (SMT)
- VIP console image refresh
- Network Equipment
  - Routers
  - Switches

ITD: 911 B/U DISPATCH CENTER

- Symphony IP Dispatch Consoles:
  - Replacement of the Symphony Dispatch PC hardware, including:
    - Symphony Dispatch Platform (3.0)
    - Upgrade O/S to Windows 11
    - Refresh Premier console image for SR11
    - Existing licenses will be transferred
- System Management Terminals (SMT)
- VIP console image refresh
- Network Equipment
  - Routers
  - Switched

COG : MULTISITE – GREENFIELD WATER TANK (WT)

L3H proposes the following LMR equipment for the new RF site:

- One (1) 4-channel, 700 MHz, P25 Phase 2, RF multisite including:
  - P25, P2 Multi-Site common equipment
  - Four (4) 700 MHz MASTR-V base stations
  - One (1) VIDA Virtual Site Manager (VVS)
    - Active Low Digital Inputs: Capacity Qty (48), Connected Qty (10), Spare (6)
    - Active High Digital Inputs: Capacity Qty (8), Connected Qty (0), Spare (8)
    - Active High Digital Outputs: Capacity Qty (8), Connected Qty (0), Spare (8)
- RF antenna system will include:
  - Two (2) antennas (1 Tx, 1 Rx)
  - One (1) 4-CH combiner
  - One (1) 8-CH Multicoupler/TTA system
  - One (1) Tx filter with power monitor, DC
  - Coax cables, and connectors to accommodate existing water tank height.
- Network Equipment
  - 10 MHz reference clock
  - One (1) Cisco site access router
  - One (1) Cisco Ethernet switch
- One (1) -48V DC power plant
  - 16 hours of backup capacity
  - 24-hour recharge rate

L3H REQUIREMENTS

Monterey/City of Greenfield will be responsible for ensuring the following requirements are met to accommodate the L3Harris LMR equipment in the new equipment shelter.

Figure 13. LMR Equipment Requirement Snapshot

UTILITY POWER	BACKUP POWER
• Voltage / phase: 208/240 VAC, 2 Phase • Main Service Amps: 200A or 400A (Customer provide) • DC Power for LMR: -48VDC (L3H provided)	• Generator run-time: 16 Hrs. • DC back-up run-time: 16 Hrs. • Generator Size: 15 kW • HVAC Size: 1.0 Ton

CUSTOMER PROVIDED SHELTER	MINIMUM CIRCUIT REQUIREMENTS
• Space for (3) open racks of equipment (MW not incl.) – Rack dimensions: 85.5" H, 20.5" W, 19.295" D – 36" of free aisle space (in front and in the rear) • Two (2) empty cable entry port	• Protected Main Circuit – 200A / 400A • One (1) 30A Circuits W/L6-30R Twist Lock Receptacles • Two (2) 20A Circuit • Two (2) 15A Circuit

Figure 14. DC Power System Schematic

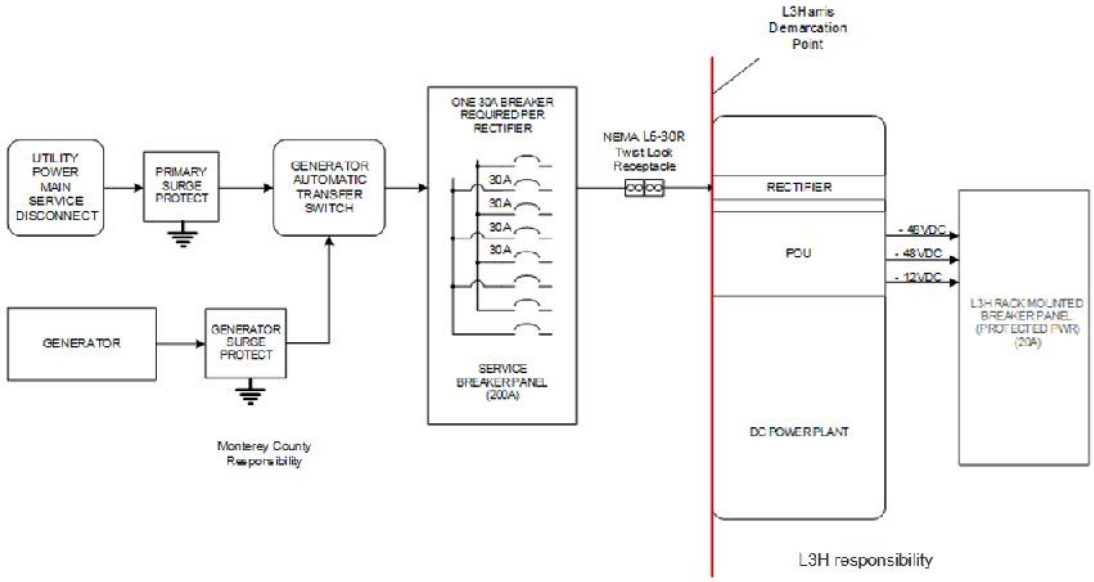


Figure 15. Example Rack Floorplan in Typical LMR Shelter

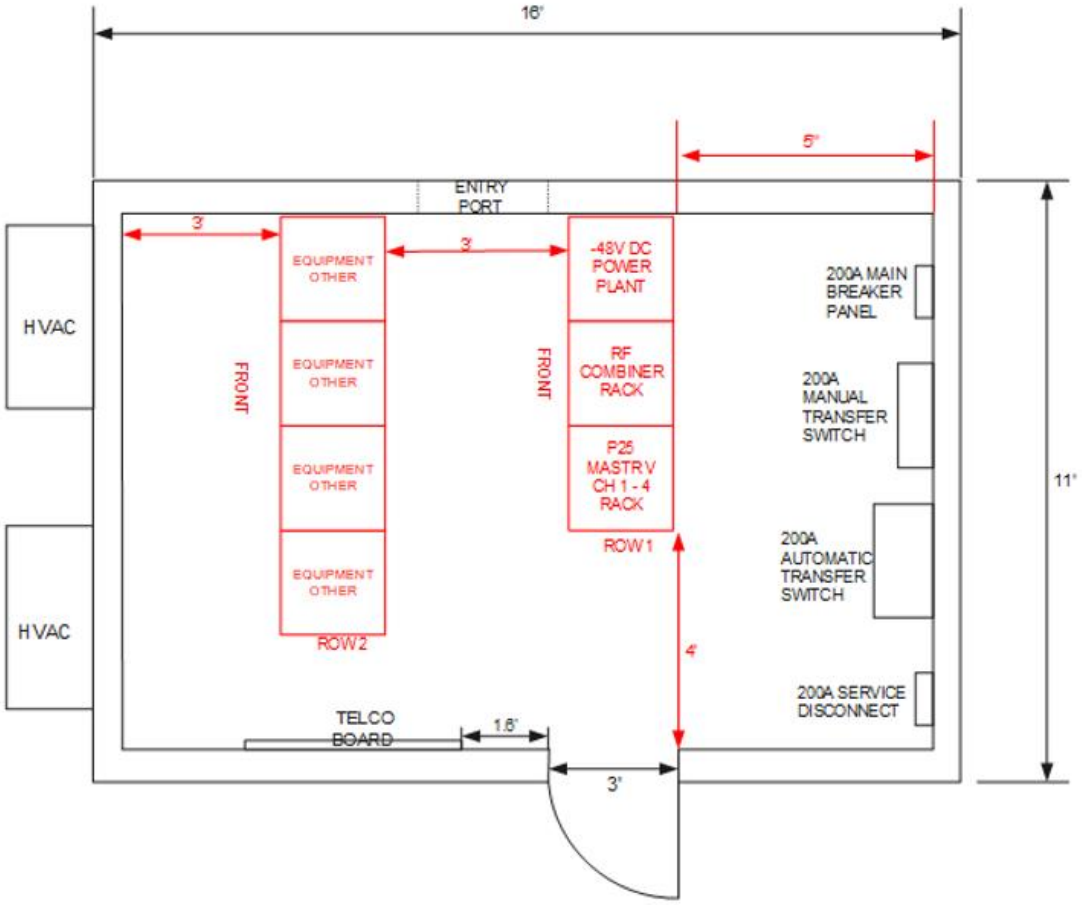
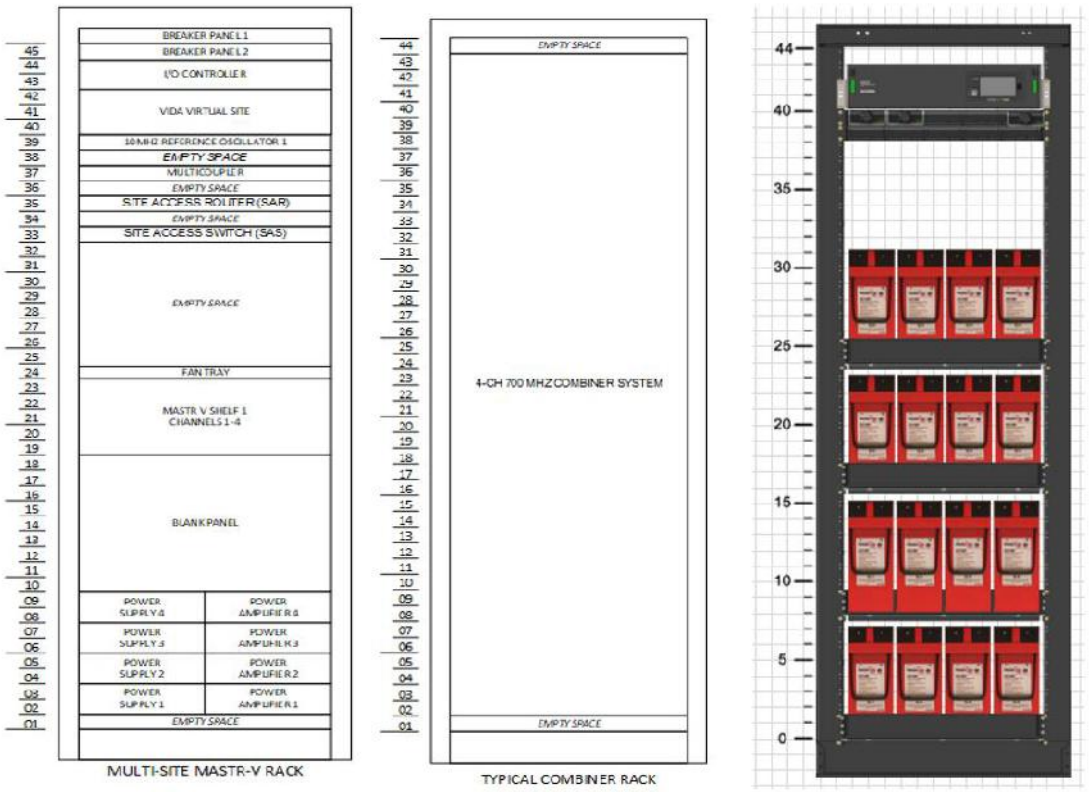


Figure 16. LMR Equipment & DC Power Plant Rack Diagram



Coverage Solution

COVERAGE MODEL

L3Harris' internal toolset for propagation modeling is known as RAPTR (Radio Analysis and Propagation Tool Repository). RAPTR propagation modeling is compatible with Telecommunications Industry Association (TIA) Telecommunications Systems Bulletin TSB-88 "Wireless Communications Systems - Performance in Noise and Interference Limited Situations – Recommended Methods for Technology-Independent Modeling, Simulation, and Verification." RAPTR uses the Okumura-Hata-Davidson (OHD) model as described in TSB-88. Factors relating to environment and terrain combine to derive the total path loss value. RAPTR employs the Epstein-Peterson diffraction model in conjunction with the OHD model in a proprietary method to greatly enhance the path loss calculation. The diffraction calculations coupled with the environment database further increase the accuracy of the path loss calculation.

RAPTR uses a tile method for analyzing the propagation, a much more accurate method than the older radial method. Radial methods begin to lose resolution as the distance from the site increases, the distance increases between evaluation locations from radial to radial. The tile method uniformly predicts the coverage for a system by dividing the project area into small areas called tiles. The size of the tiles used by RAPTR is three arc-seconds, approximately 300 feet per side. RAPTR models the propagation from a site to each tile in the project area. With the tile method, the interaction of signals from different sites can be more accurately determined. This increases the accuracy of evaluating coverage for simulcast systems, voting systems, multisite networks, interference, and handoff (roaming).

The RAPTR path loss calculation methods are the result of evaluating over 189,000 different propagation paths as part of an extensive data collection effort performed over a period of years. These paths encompassed a variety of terrain and environment features, ranging from over water paths, to flat terrain, to mountainous areas. It also included varying environmental conditions, ranging from highly urbanized areas to rural, open, and forested areas. As a result, the propagation model has been refined to perform in all the conditions present in a land-mobile radio system. The model is accurate from flat terrain to highly rugged mountainous terrain, and from urban to rural areas.

TERRAIN DATABASE

The accuracy of any coverage prediction is to a large degree dependent upon the terrain data available for the project. RAPTR makes use of three arc-second database derived from the United States Geological Survey (USGS) Digital Elevation Model (DEM) data that provides high resolution and accuracy, both spatially and in elevation. More recent USGS 30-meter data can supplement the database providing higher degrees of resolution and accuracy. The 30-meter data incorporates into the main RAPTR terrain database using methods described in TSB-88. L3Harris uses 30-meter data when available from the USGS for analyzing the coverage design and predictions.

The terrain data can be displayed within RAPTR to give system designers the ability to locate sites based on elevation. The terrain can be displayed in either an aerial view, as a colored contour map or combined as shown in Figure 17 and Figure 18.

Figure 17. City of Greenfield Terrain Data

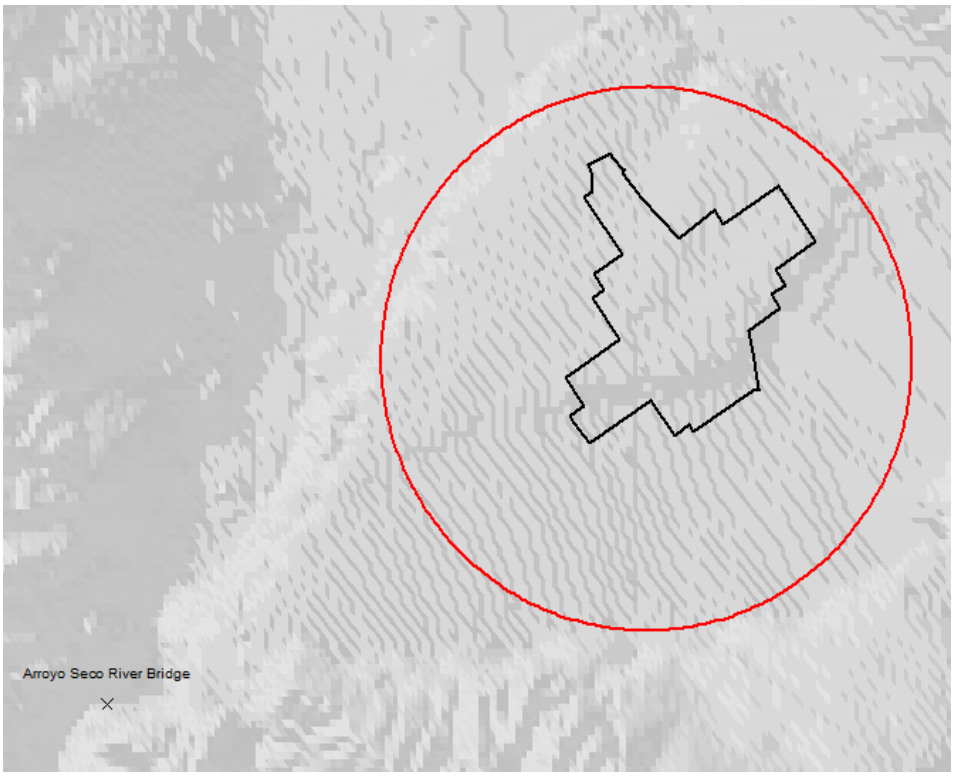
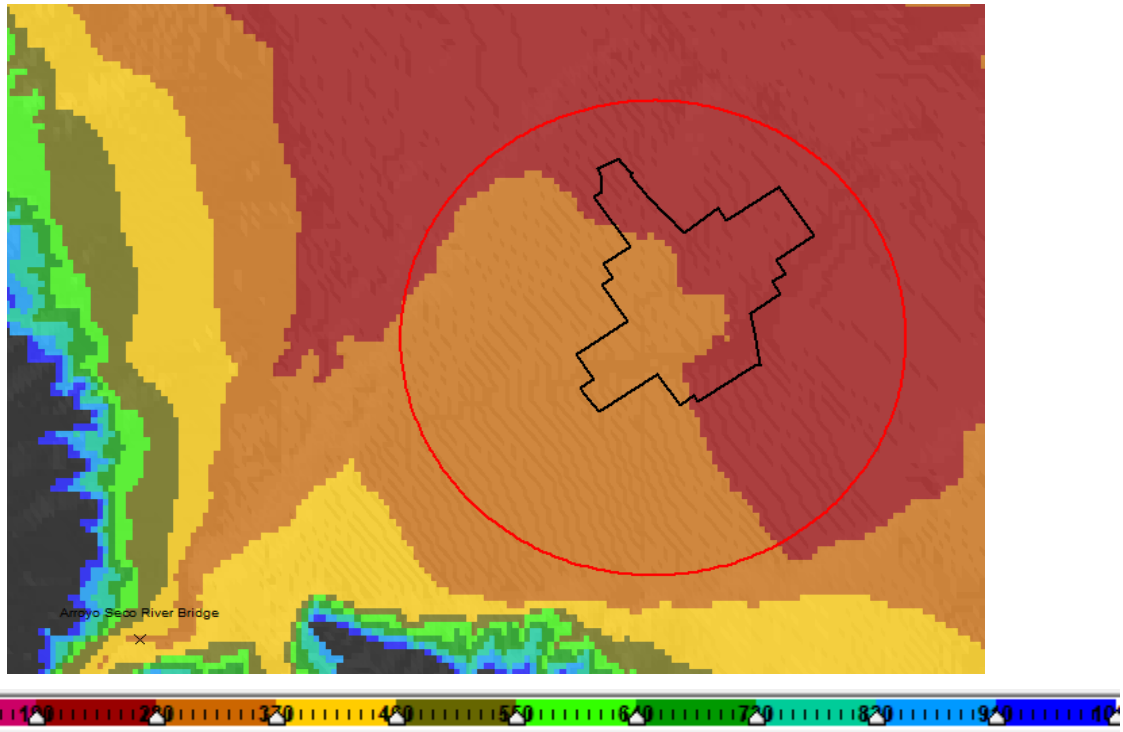


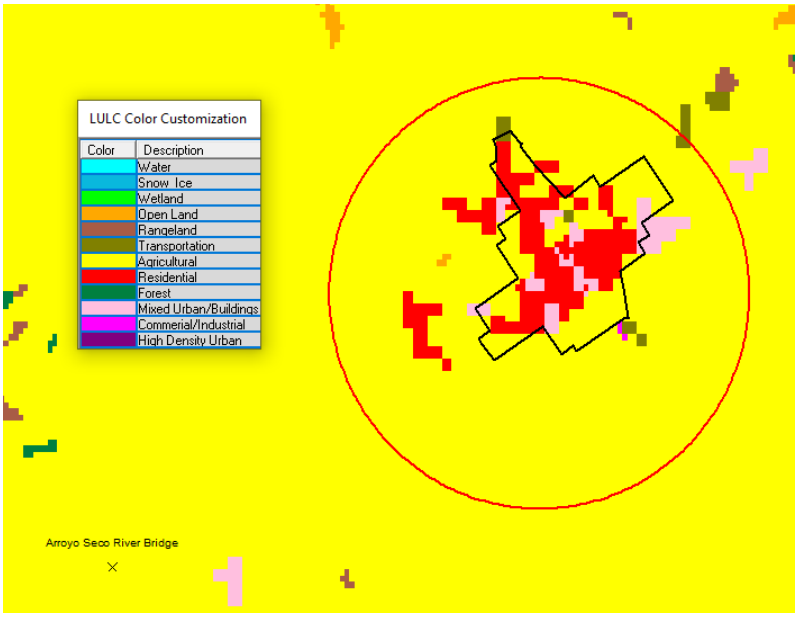
Figure 18. City of Greenfield Terrain Data with Elevation



ENVIRONMENT DATABASE

Using an environment database further enhances the coverage prediction accuracy. This database describes the ground structures contained in an area such as urban, residential, forest, water, etc. It increases the coverage design accuracy by allowing the propagation model to account for the type of local clutter present. RAPTR's main database derives from the USGS Land Use Land Clutter (LULC) data set. The City of Greenfield's environment database information is shown in Figure 19.

Figure 19. City of Greenfield Environment Database



RAPTR employs sophisticated analysis techniques when evaluating coverage. Instead of only considering what the environment type is at the location, or tile, being evaluated, it also considers the environment surrounding the location. This further increases the accuracy of coverage predictions by detecting transitions in the environment – for instance, when transitioning from agricultural to forest, or urban to suburban. In addition, a designer can select from a category of environment. For example, the designer can select from the forest environment class categories of pine, hardwood, mixed, etc.

Also, RAPTR can perform an analysis of the environment and classify it based on density. This increases the accuracy of coverage predictions by being able to account for dense forests and sparse forests. All these factors combine to allow RAPTR to incorporate a very detailed model of the environment into coverage designs.

Coverage Predictions

COVERAGE DESIGN

The L3Harris coverage design is based on bounded area reliability and is path-balanced for portable radios, meaning portable radio coverage is equal in the talk out and talk back directions. The design is established to achieve DAQ 3.4 voice quality, or better, throughout the predicted covered areas, as described below in Figure 20.

Figure 20. Delivered Audio Quality Classifications as defined by TSB-88

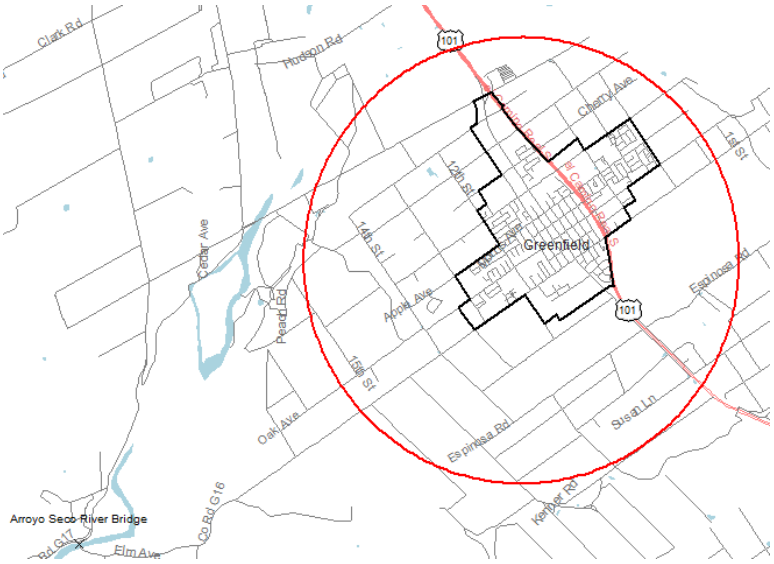
DELIVERED AUDIO QUALITY	SUBJECTIVE PERFORMANCE DESCRIPTION
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent noise/distortion.
DAQ 4.0	Speech easily understood. Occasional noise/distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some noise/distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to noise/distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to noise/distortion.
DAQ 1.0	Unusable: speech present but unreadable.

It is important to note that usable coverage extends beyond DAQ 3.4. In areas that do not have DAQ 3.4 coverage, but have DAQ 3.0 coverage, users will still be able to make portable calls, with occasional repetition, as this is still usable coverage.

BOUNDARY

L3Harris created a two-mile offset of the location of the water tower which is shown in red and also brought in the GIS boundary for the City of Greenfield shown in black on Figure 21. The Arroyo Seco River Bridge was listed as a point of interest and is included below. Roads are included for reference.

Figure 21. City of Greenfield Service Area Boundaries



SYSTEM PARAMETERS

- Portable Height: 3.5 ft
- Portable Terminal Power: 3 W
- Portable Terminal Antenna: ¼ wave
- Minimum 250 kHz spacing between transmit frequencies.

RF SITE CONFIGURATION

The L3Harris coverage design is based on the design parameters noted in Figure 22.

Figure 22. Proposed System Design Parameters

SITE	LATITUDE	LONGITUDE	MAX ERP (W)	TX ANT CL (FT)	RX ANT CL (FT)	TX AND RX ANTENNA MODEL
GWT	36.3176	-121.25	257	60	60	SC46A-HF1LDF(D00-PIP)

COVERAGE MAPS

- L3Harris has included a full complement of coverage maps. A sampling of those coverage maps is included here.
- All maps represent P25 Phase 2 Trunking DAQ 3.4 or better communications to a receiver terminal at the indicated level (e.g., mobile, portable outdoors, portable indoor). A base map is included underneath as a reference. The following colors are used to represent coverage:

- Green represents areas predicted to reliably have DAQ 3.4 or better communications
- White represents areas not predicted to have reliable DAQ 3.4 communications due to inadequate signal level

Figure 23. List of Coverage Maps Included in Proposal

MAP #	MAP NAME	TYPE	DAQ LEVEL
1	City of Greenfield Portable Outdoor Talk-Out Coverage	Portable Outdoor	3.4
2	City of Greenfield Portable Outdoor Talk-Back Coverage	Portable Outdoor	3.4
3	City of Greenfield Portable Indoor 20 dB Talk-Out Coverage	Portable Indoor 20 dB	3.4
4	City of Greenfield Portable Indoor 20 dB Talk-Back Coverage	Portable Indoor 20 dB	3.4
5	City of Greenfield Portable Indoor 25 dB Talk-Out Coverage	Portable Indoor 25 dB	3.4
6	City of Greenfield Portable Indoor 25 dB Talk-Back Coverage	Portable Indoor 25 dB	3.4
7	City of Greenfield Portable Indoor 30 dB Talk-Out Coverage	Portable Indoor 30 dB	3.4
8	City of Greenfield Portable Indoor 30 dB Talk-Back Coverage	Portable Indoor 30 dB	3.4

The City of Greenfield's portable outdoor talk-out coverage is shown in Figure 24, the portable indoor 20 dB talk-out coverage is shown in Figure 25, the portable indoor 25 dB talk-out coverage is shown in Figure 26 and the portable indoor 30 dB is shown in Figure 27.

Figure 24. City of Greenfield Portable Outdoor Talk-Out Coverage

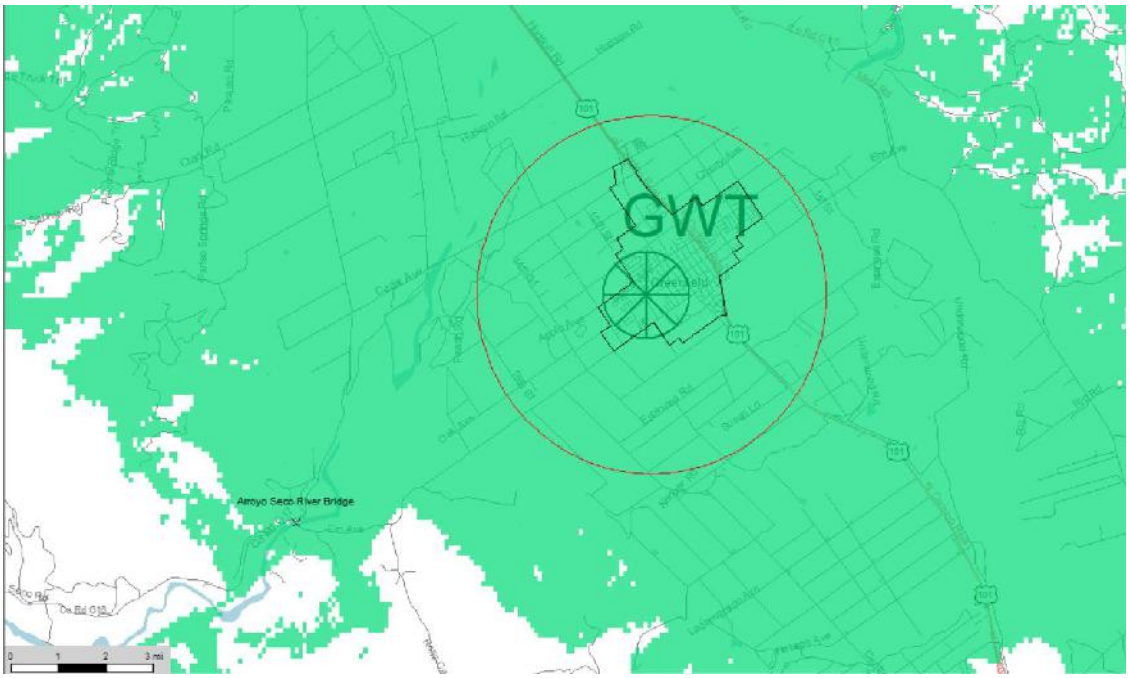


Figure 25. City of Greenfield Portable Indoor 20 dB Talk-Out Coverage

Figure 26. City of Greenfield Portable Indoor 25 dB Talk-Out Coverage

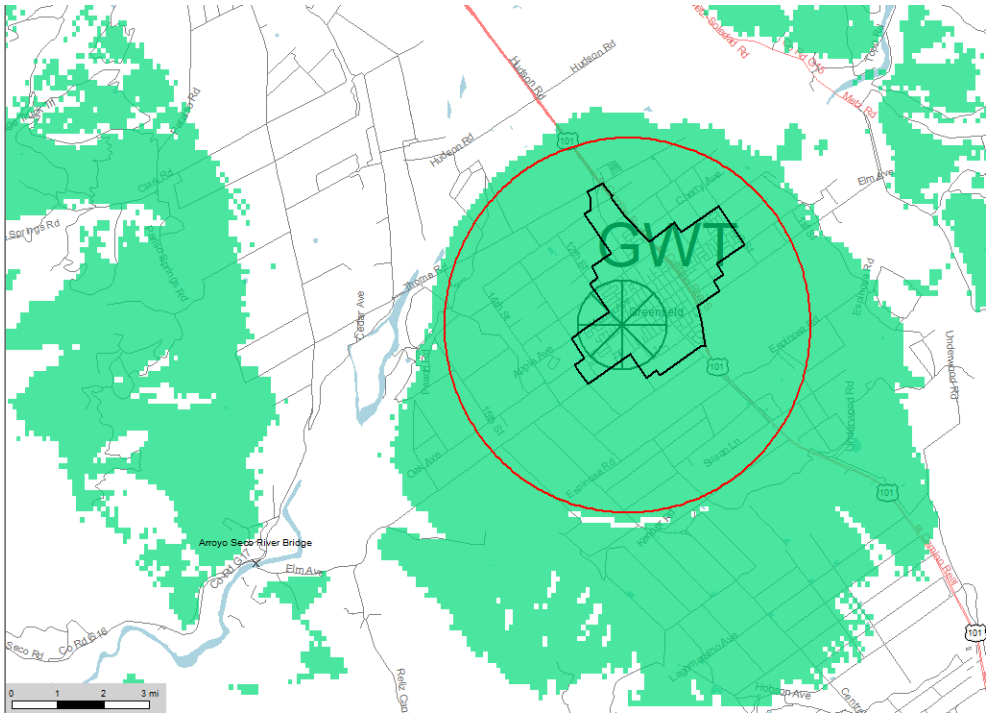
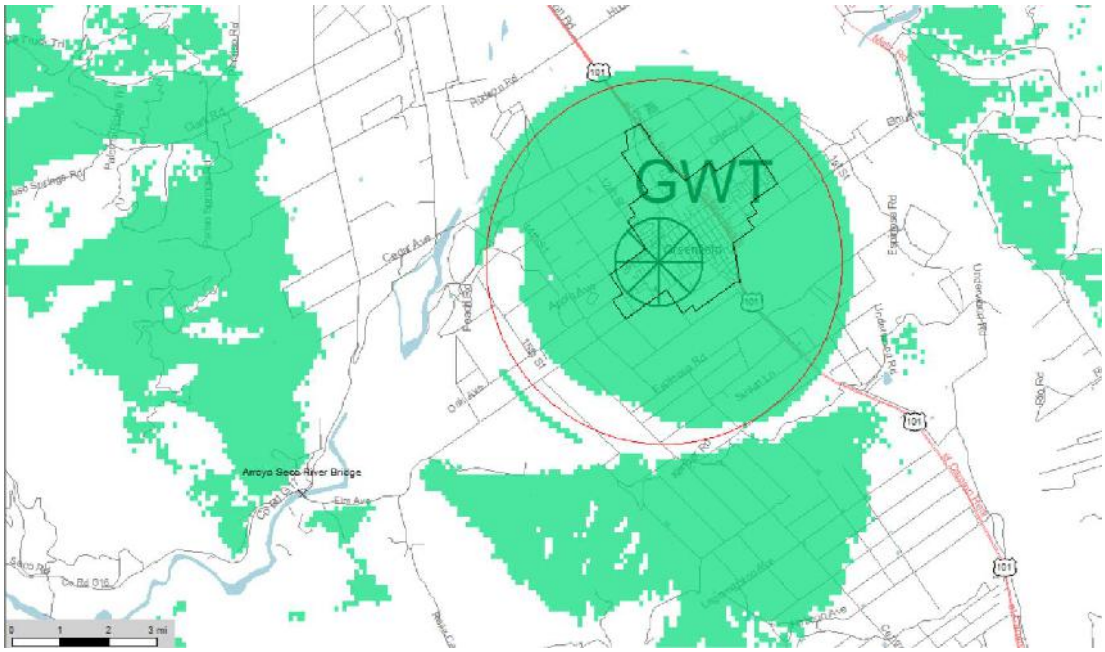


Figure 27. City of Greenfield Portable Indoor 30 dB Talk-Out Coverage



COVERAGE CHARACTERIZATION

L3Harris has included a Coverage Characterization Test Plan (CCTP) that will demonstrate the coverage predictions provided to the City of Greenfield. The tests listed below will be used to demonstrate the RF coverage throughout the City of Greenfield.

- Talk Out Bit Error Rate (BER)
- Talk Out Signal Strength

For detailed information on the coverage tests, refer to the CCTP.

FREQUENCY PLANNING

The City of Greenfield is responsible for all frequency acquisition.

The City of Greenfield is responsible for obtaining assistance from co-located entities for interference testing and mitigation.

- The City of Greenfield must include language in the site lease agreements that all carriers co-located at the water tower agree to temporarily turn off transmitters to assist in testing and mitigation if interference is detected.
- Co-located transmitters could create intermodulation interference that could affect normal operation, coverage footprint, and audio quality for the radio system.
- If interference is detected, the city must provide coordination with the owners of the co-located transmitters for L3Harris to assist in interference mitigation.

ASSUMPTIONS AND RESPONSIBILITIES

The following are the L3Harris (L3H) assumptions based on the project scope:

- Monterey will provide adequate space at all locations where LMR equipment is being installed or upgraded.
- Monterey will provide sufficient power, grounding, and ventilation at all locations where LMR equipment is being installed or upgraded.
- Monterey will continue to provide sufficient backhaul connectivity & bandwidth to support the full upgrade scope.
- There is no coverage guarantee included for City of Greenfield with this proposal. Informational only coverage plots are included.
- L3Harris is only replacing the network H/W for the core, dispatch & radio shop.
- The system acceptance ATP will only include the core, dispatch, City of Greenfield and three of the existing RF sites, TBD.
- Monterey/Greenfield is responsible for all City of Greenfield site civils.

- Monterey/Greenfield is responsible to provide space on existing water tank for new antenna system. New Phase 2 Tx/Rx Antenna system will be mounted on existing water tank structure.
- Monterey/Greenfield is responsible for any/all RF site leasing agreements, antenna/rack space lease agreements, if applicable.
- Monterey/Greenfield will be responsible for frequency planning of (4) new 700 MHz frequencies from FCC. Including preparing and filing necessary paperwork with the FCC.
- Monterey/Greenfield responsibility to perform an Intermodulation Analysis to search for Co-Channel & Adjacent Channel Interference & perform corrective actions if required.
- Monterey/Greenfield are responsible to perform a structural analysis on the already overloaded water tank (existing) and ensure it can support new Phase 2 antenna equipment.
  - Based of structural results, if water tank structure requires remediation, it will be the responsibility of Monterey/Greenfield to perform/pay for any/all required corrective actions prior to implementation.
- City of Greenfield will perform frequency planning & Intermodulation Analysis, as required if existing frequency plan changes.

SUPPORT SERVICES OVERVIEW

System Installation

L3Harris personnel will provide physical installation of the new equipment and L3Harris engineering will power up and test.

Site preparation of power and grounding for the new equipment is outside the scope of this proposal. L3Harris can expect that there is sufficient power, grounding, ventilation, and floor space for the new NSC equipment cabinets.

Acceptance Testing

L3Harris will perform a mutually agreed upon on-site system acceptance testing per the attached functional acceptance test plan (ATP). The L3Harris Upgrade Team notifies Monterey County when installation and upgrade are complete, and the system is ready for acceptance testing.

SYSTEM DOCUMENTATION

L3Harris will provide typical as-built documentation for system upgrades which include:

- Rack configuration drawings
- Revised network schematics
- S/W Audit
- Configuration Files
- Technical Manuals and Users Guides for the new components.

> New As-Built Documentation

POST-WARRANTY MAINTENANCE

INFRASTRUCTURE MAINTENANCE PLAN

The complexity of critical communications systems continues to increase beyond providing voice and data capabilities. The need for continuous system monitoring to defend against cybersecurity threats, configure interoperability with neighboring agencies, and integrate with LTE technologies all require expert skills to maintain your system's optimal performance. L3Harris offers infrastructure maintenance plans to help keep your system running smoothly.

SUMMARY

L3Harris commits to the success of Monterey County, CA ’s new communications system and looks forward to a long-term partnership. Our local, regional, and factory support provides an added layer of support and allows you the flexibility to contract for the services desired to augment their existing resources. Our approach provides optimal system performance to meet your needs and protects Monterey County, CA ’s investment, while minimizing total cost of ownership.

PREPERATION AND PLANNING OVERVIEW

Partial Upgrade To SR11 – Methodology

The procedure for system upgrade usually consists of four main phases:

- Upgrade Preparation and Planning
- Core Infrastructure Replacement
- Network Updates
- Sites and Dispatch Upgrades

Each phase is completed, and the system evaluate for stability before proceeding to the next phase. A summary of tasks required to provide trouble free migration is as follows:

Upgrade Preparation And Planning

A complete audit of the existing system was conducted to verify all known devices and the specific software revisions. This audit was used to identify components within the Monterey system that could be reused, replaced, or upgraded. Prior to touching the system, L3Harris will validate that the results remain accurate.

L3Harris will review RNM alarm logs, any outstanding TAC tickets, and discuss any outstanding punch list items and document all open issues that will be resolved with the system release update, including tests plans. In addition, L3Harris will back up all current system settings, and network configurations.

As system updates are made, there may be some communication impact during each upgrade window, depending on the devices. L3Harris will provide recommendations for outage windows that can be scheduled with APPS users during the upgrade process.

Initial Site Upgrade

The migration from SR10A.2/SR10A.7 system to the new, cutting-edge SR11 solution includes a methodical approach that doesn’t take a large jump in the compatibility arena. L3Harris has validated that moving forward in a stepped fashion reduces the potential for incompatibilities and disruptions to the parts of the system not yet upgraded.

Core Upgrade By Replacement

A core replacement will provide the quickest and most seamless upgrade. This method will allow off-site staging & testing to be performed and will ensure the core works as expected before delivery to site. Then, installing the new equipment rack in close proximity to the existing rack allows for straight forward network cable moves to put the new system into service.

Network Considerations

Review current network configuration, capacity, and hardware. Identify current network equipment and design. Determine what network equipment can be re-used (if any) and what must be replaced.

RF Site Upgrades

During this upgrade step, the RF site MASTR-V base stations firmware will be upgraded. The Network Sentry (NWS) O/S will also be upgraded.

911 Dispatch Upgrade

The Symphony console PC stations will be replaced with new SDP 3.0 PC consoles stations. The VIP consoles will receive a S/W refresh. The consoles will be reconnected to the network, the previous configuration will be loaded and tested prior to being approved for dispatcher operation again.

INCLUDED SYSTEM SPARES

Equipment listed below are the minimum recommended spares included in this base proposal

PART #	DESCRIPTION	QTY
SR11 INFRA SPARES		
MANS-AN3S	Kit,GPS Antenna,Outdoor,For Netclock	1
VS-CN1L	SERVER, UNITRENDS 9006 BACKUP APPLIANCE	1
VS-CR3D	FIREWALL,FPR1010, WITH ANYCONNECT	1
VS-CU9B	SWITCH,SMARTNET,C9200L-24T-4X-A	1
VS-CR3C	ROUTER,APP,C921-4P	1
VS-CU9A	SWITCH,SMARTNET,C1000FE-24T-4G-L	1
SAMD8G	CONTROLLER, DIGITAL I/O	1
VS-CJ4J	POWER SUPPLY, CUI, DC-DC CONV,C1111	1
VS-CU8Z	SWITCH,SMARTNET,C1000-16T-E-2G-L	1
VS-CU7Y	MODULE,SFP GBIC	2
NS-CP9T	TIME SERVER, PROTEMPIS, NTP TS200	1

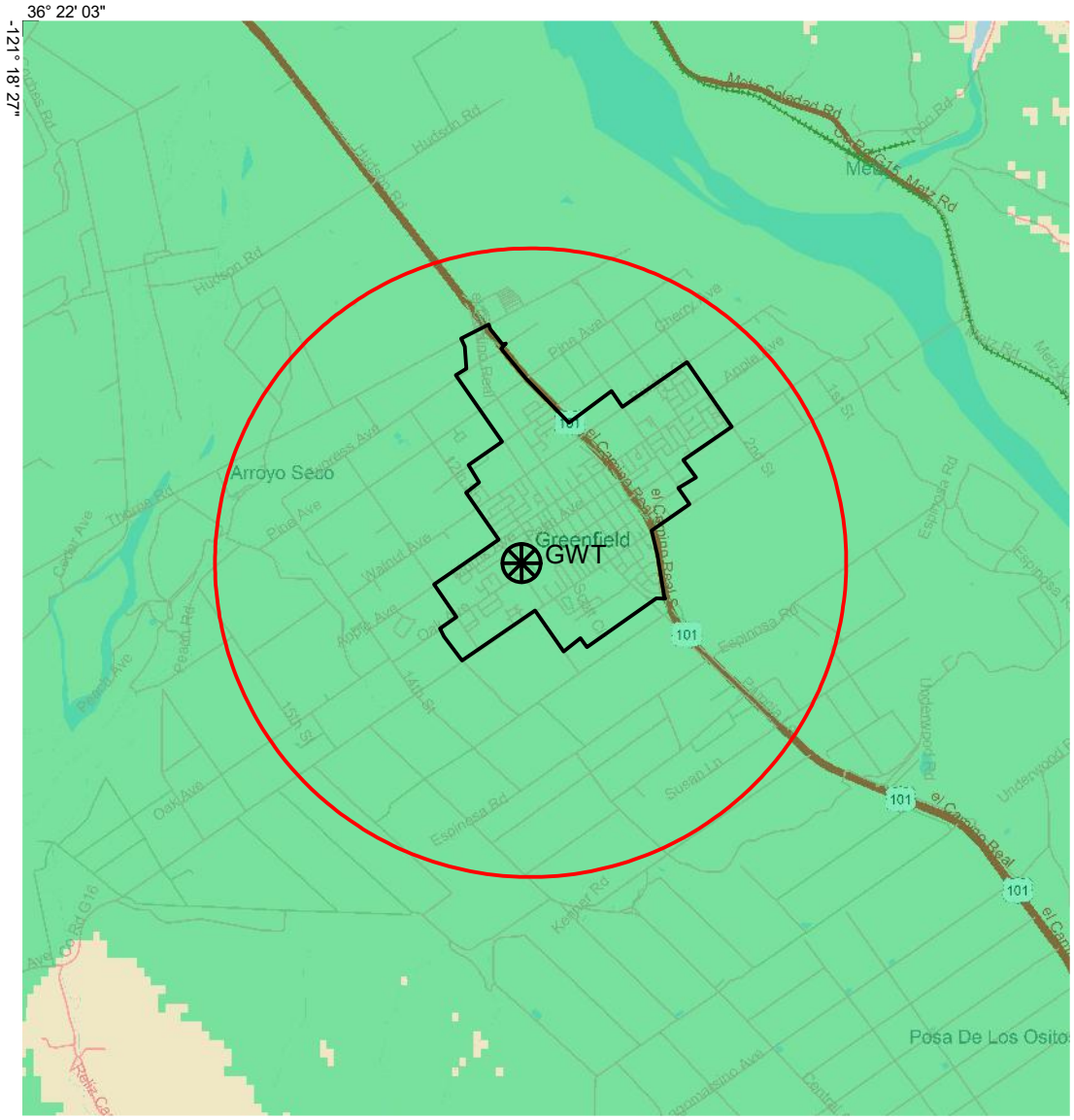
PART #	DESCRIPTION	QTY
VS-CR1Z	ROUTER,ISR,C1111-4P,APP	1
VS-CR2B	ROUTER,ISR,C1111-8P	1
VS-CR1V	ROUTER,ISR,C1111-4P	1
VS-CR1Y	ROUTER,ISR,C1111-4P,SEC	1
NS-DF3H	PC,SYSTEM MANAGEMENT TERMINAL	1
	SYMPHONY CONSOLE 3-0 SPARE HW	
UD-DF3P	CONSOLE, SYMPHONY DISPATCH PLATFORM 3.0	1
UD-AB1F	MOUSE, OPTICAL, USB, SCROLL WHEEL	1
UD-AB1G	KEYBOARD, 104 KEY, USB	1
UD-SG4W	LICENSE,AES AND DES LEVEL ENCRYPTION	1
UD-SG4T	LICENSE,CONVENTIONAL CONTROLS	1
UD-SG4U	LICENSE,PAGING CAPABILITY	1
UD-SG4V	LICENSE, RTT/RSM FEATURES	1
UD-SG4Y	LICENSE,REMOTE AUX I/O	1
UD-SH2L	LICENSE,MARKER TONE	1
UD-SH2N	LICENSE,CALL ALERT,SEND ONLY	1
UD-SH1W	LICENSE,FLEXPATHS	1
	CITY OF GREENFIELD INFRA SPARES	
SA-MD6H	OSCILLATOR, 10MHZ REF,-12VDC,6 PORT	1
VS-CR1Y	ROUTER,ISR,C1111-4P,SEC	1
VS-CJ4J	POWER SUPPLY, CUI, DC-DC CONV,C1111	1
VS-CU8Z	SWITCH,SMARTNET,C1000-16T-E-2G-L	1
VS-CU7Y	MODULE,SFP GBIC	2
SAMD8E	SITE MANAGER, VIDA EDGE	1
SAMD8G	CONTROLLER, DIGITAL I/O	1
SAMD8K	MODULE, DIGITAL IN (8) & OUT SOURCE (8)	1
SAMD9B	MODULE, DIGITAL INPUT (16) ACTIVE LOW	1
SAMD8R	POWER SUPPLY, DC, VIDA EDGE	1
MASV-700M1-A	STATION,MASTR V,P25T,700 MHZ	1
SV-AW5L-A	POWER AMPLIFIER,LINEAR,700 MHZ	1
SV-PS2P-DC	Power Supply,-48V,DC,MASTR V	1

PART #	DESCRIPTION	QTY
EA-555012-001	Ethernet Switch Module,MASTR V	1
SV-PM1C	Processor,Baseband Module,MASTR V	1
EA-555004-001	Traffic Control Module,MASTR V	1
SV-NZN8S-DC	Fan Tray,MASTR V, DC	1
E75-0298-001	TOWER TOP AMP, 799-817MHZ, N-FEMALE	1
E75-4008-139	ANT,746-869,10DB,360,SGL,0DT,DIN,PPR	1
A33-1003-006	MULTICOUPLER,799-817MHZ,6MHZ,DC,8CH	1

RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:23:23
Project: Monterey County, California
MBP: 29149
Figure: 01 - City of Greenfield Portable Outdoor Talk-Out Coverage
Design: Bounded Area
Service: Portable, Talkout, Outdoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

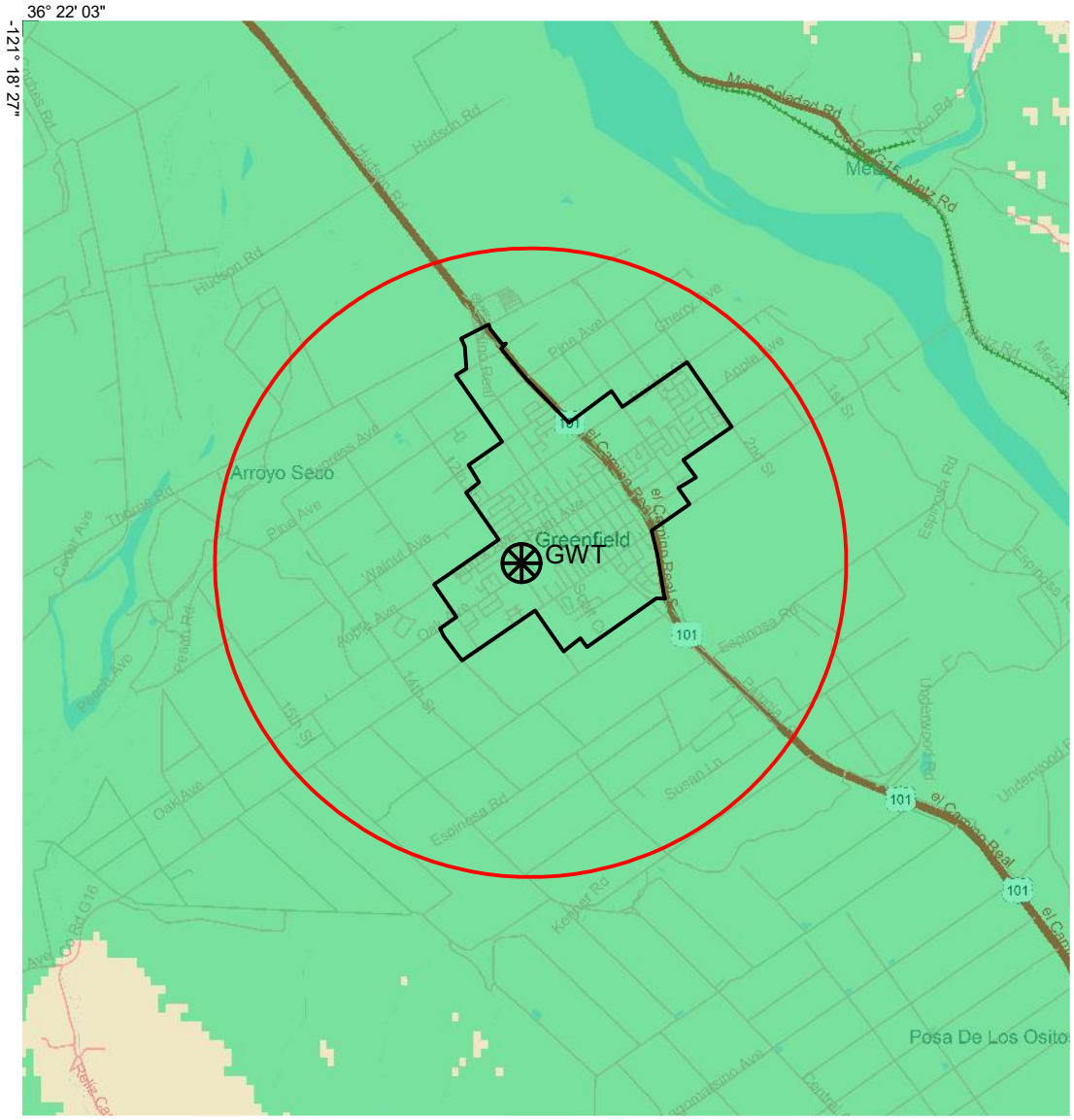
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:25:22
Project: Monterey County, California
MBP: 29149
Figure: 02 - City of Greenfield Portable Outdoor Talk-Back Coverage
Design: Bounded Area
Service: Portable, Talkback, Outdoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

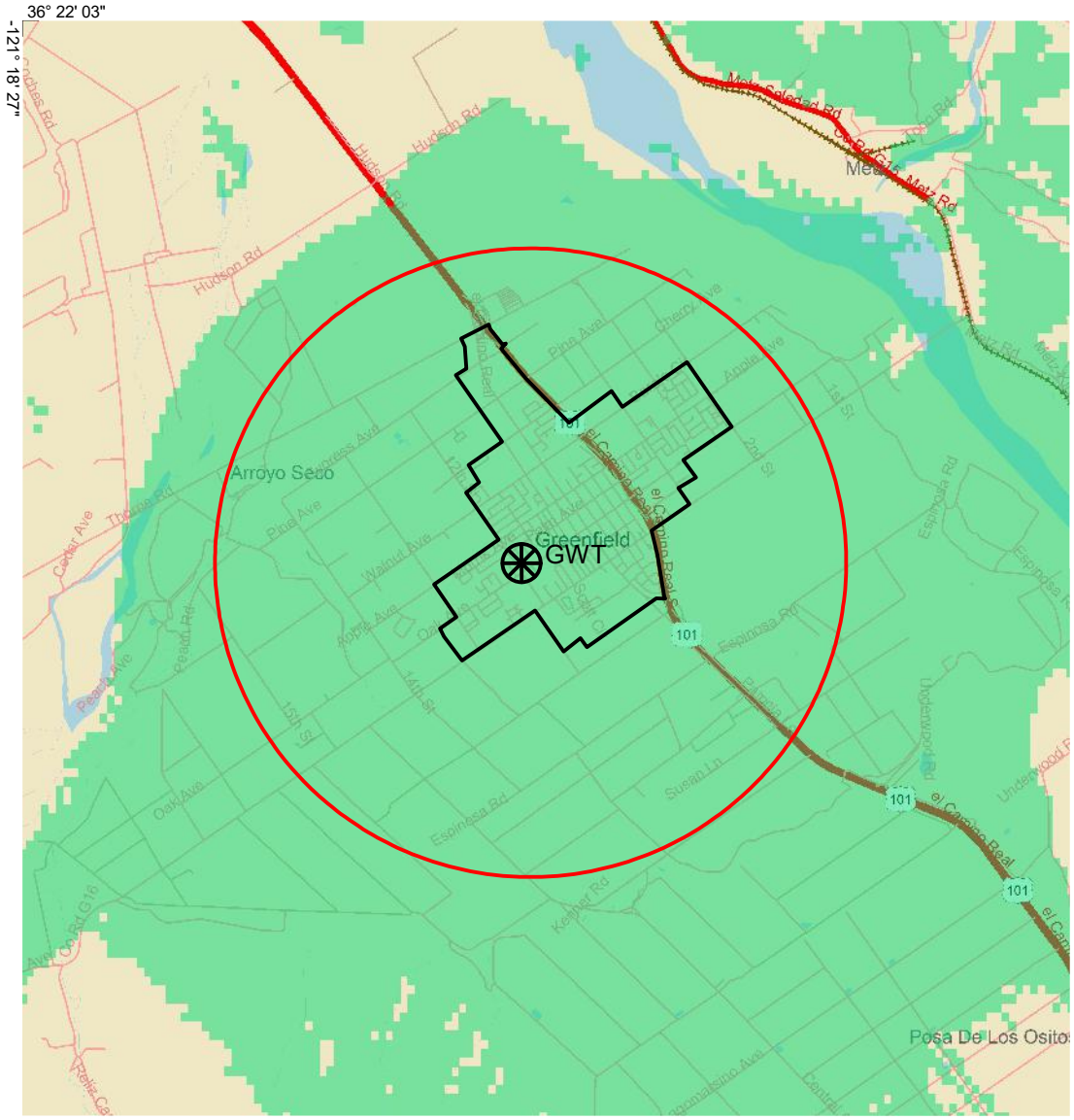
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:28:18
Project: Monterey County, California
MBP: 29149
Figure: 03 - City of Greenfield Portable Indoor 20 dB Talk-Out Coverage
Design: Bounded Area
Service: Portable, Talkout, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

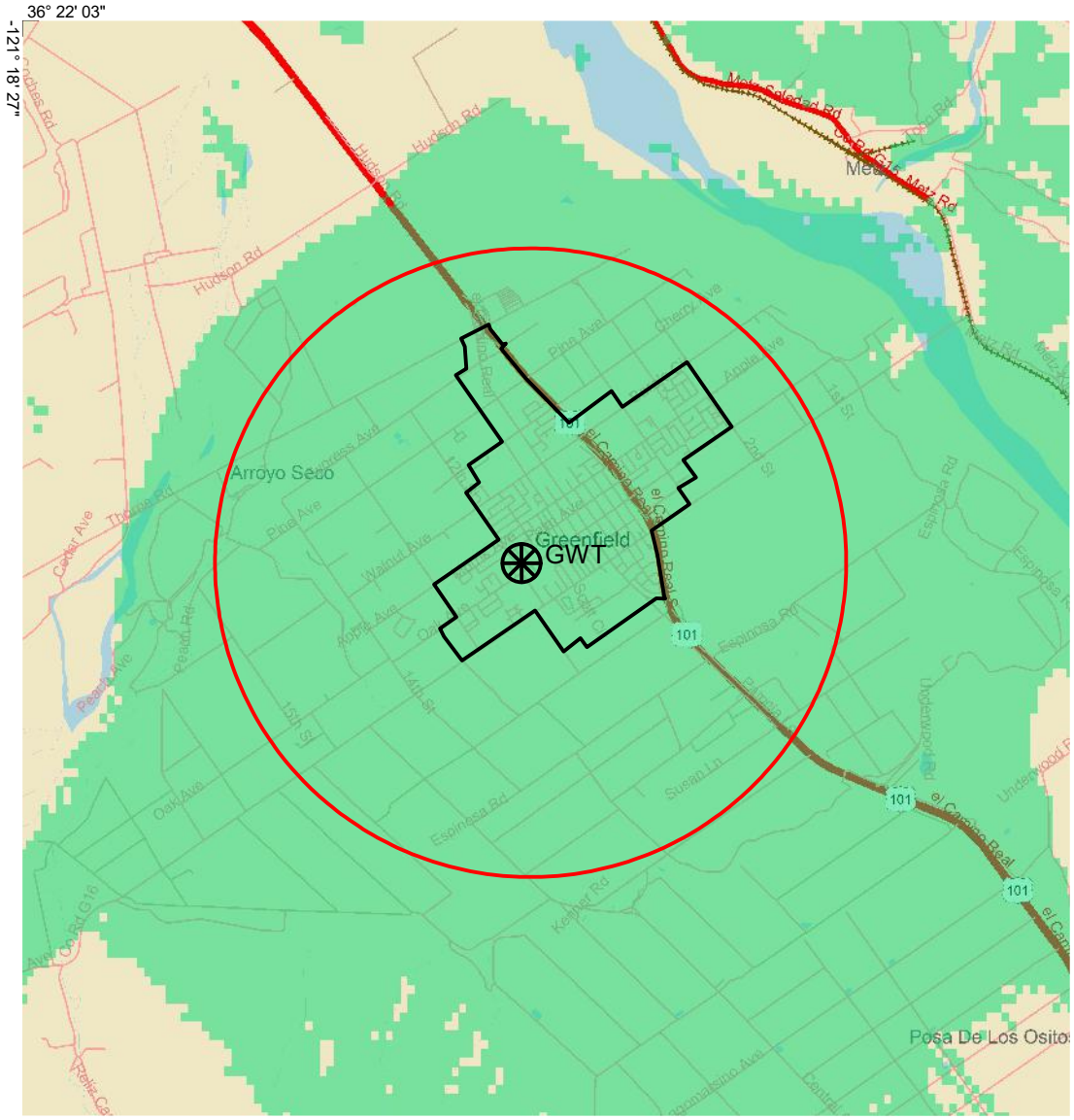
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:28:35
Project: Monterey County, California
MBP: 29149
Figure: 04 - City of Greenfield Portable Indoor 20 dB Talk-Back Coverage
Design: Bounded Area
Service: Portable, Talkback, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

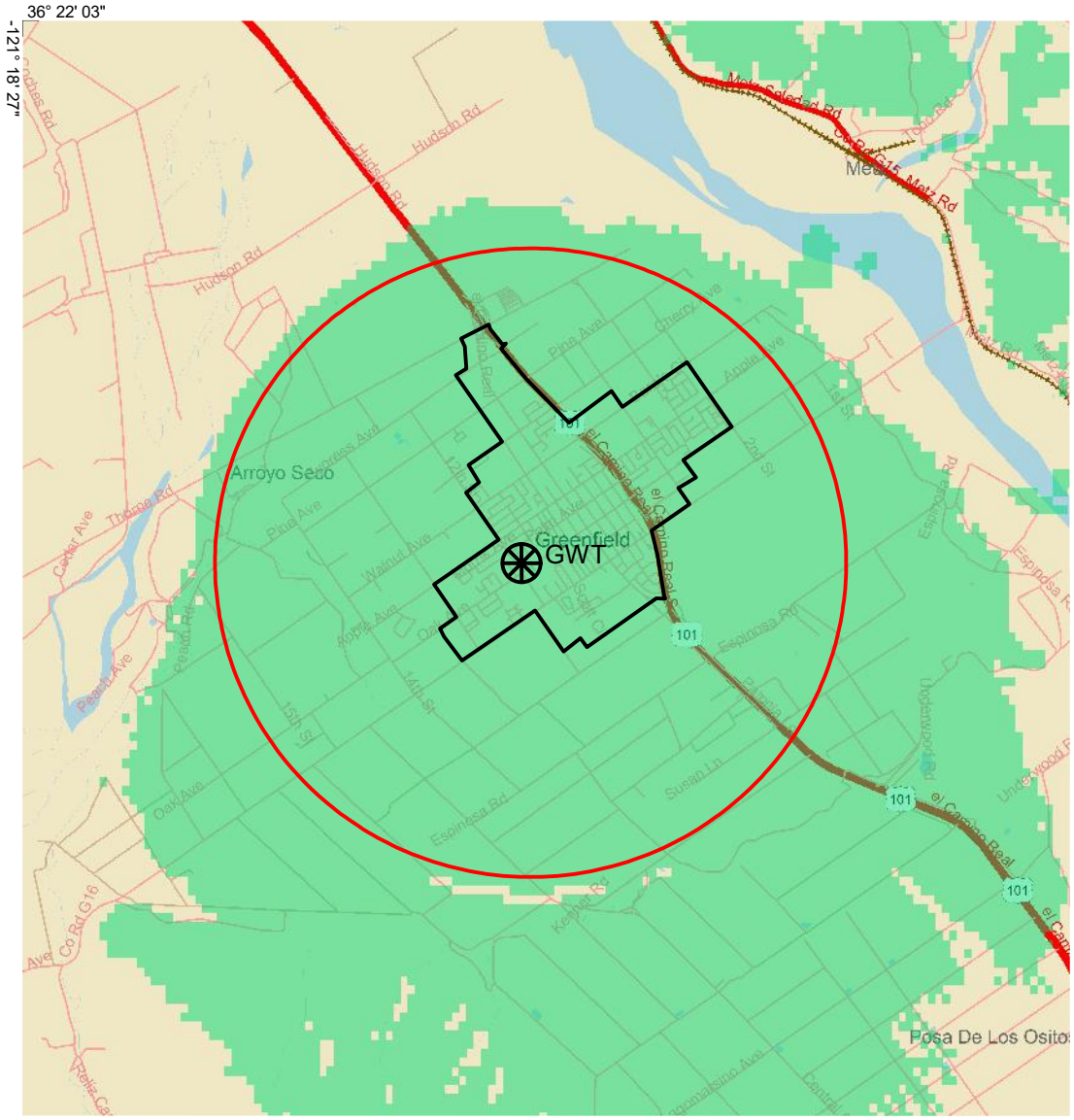
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:29:39
Project: Monterey County, California
MBP: 29149
Figure: 05 - City of Greenfield Portable Indoor 25 dB Talk-Out Coverage
Design: Bounded Area
Service: Portable, Talkout, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

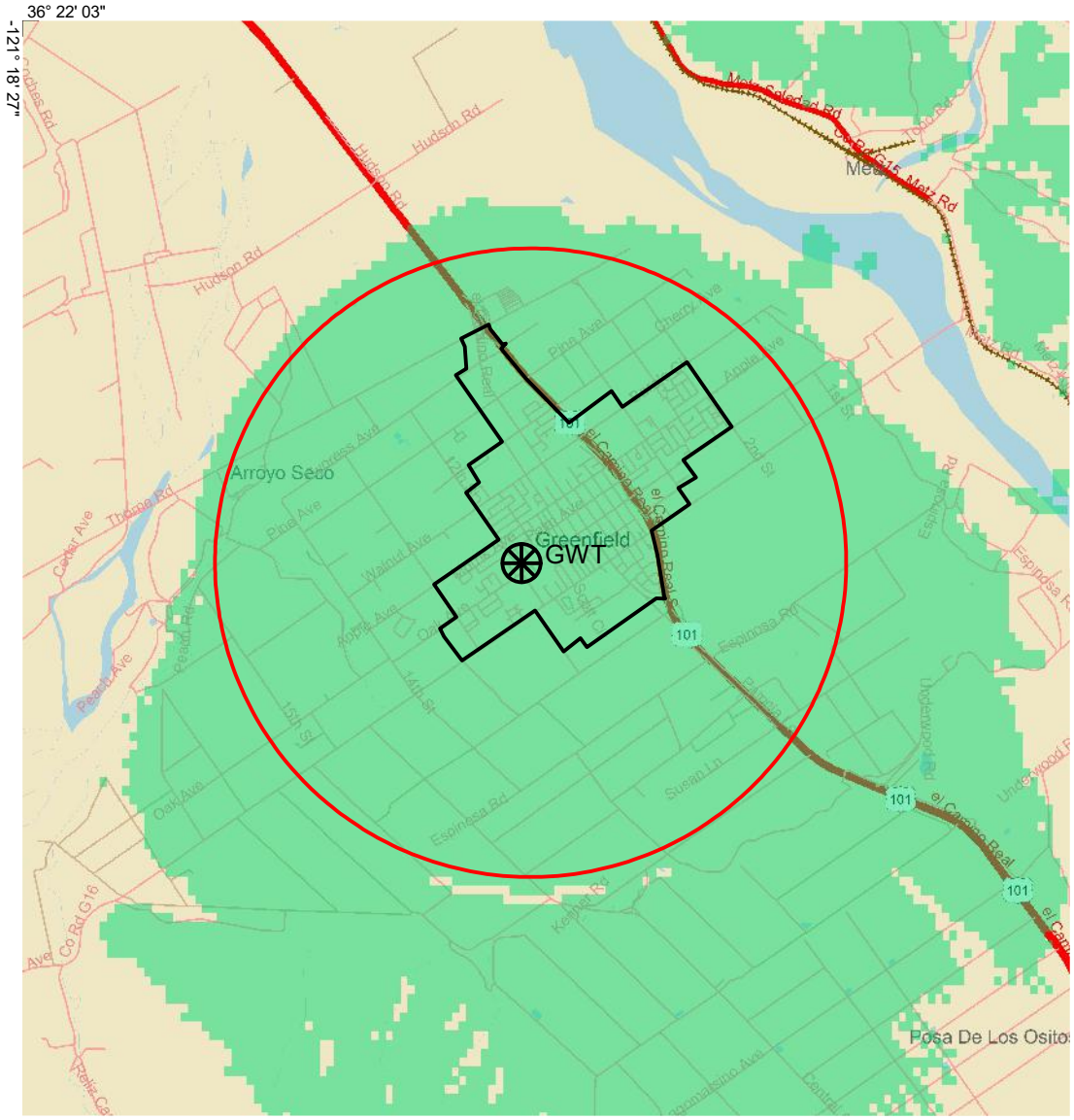
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:29:54
Project: Monterey County, California
MBP: 29149
Figure: 06 - City of Greenfield Portable Indoor 25 dB Talk-Back Coverage
Design: Bounded Area
Service: Portable, Talkback, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

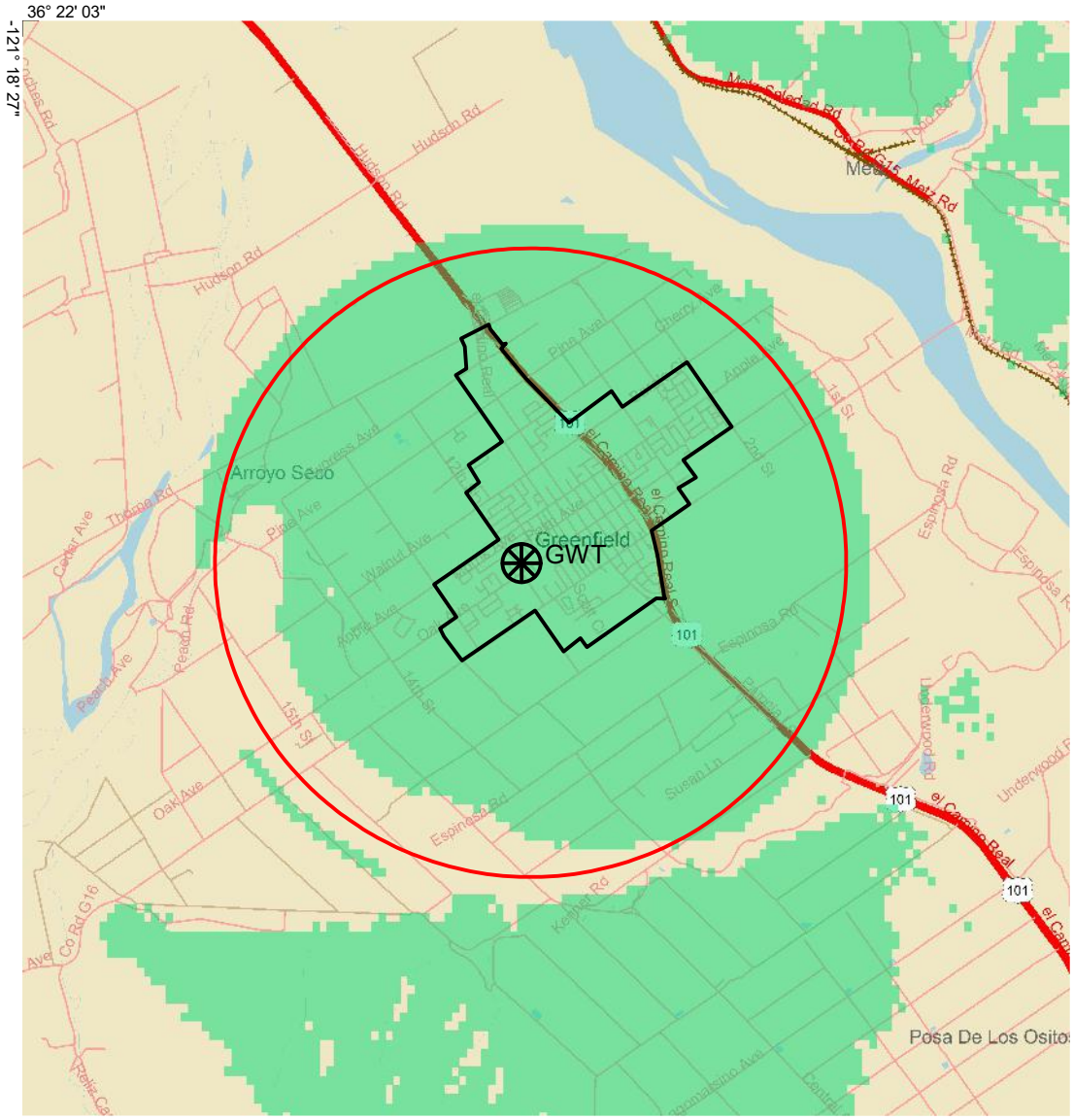
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:30:42
Project: Monterey County, California
MBP: 29149
Figure: 07 - City of Greenfield Portable Indoor 30 dB Talk-Out Coverage
Design: Bounded Area
Service: Portable, Talkout, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

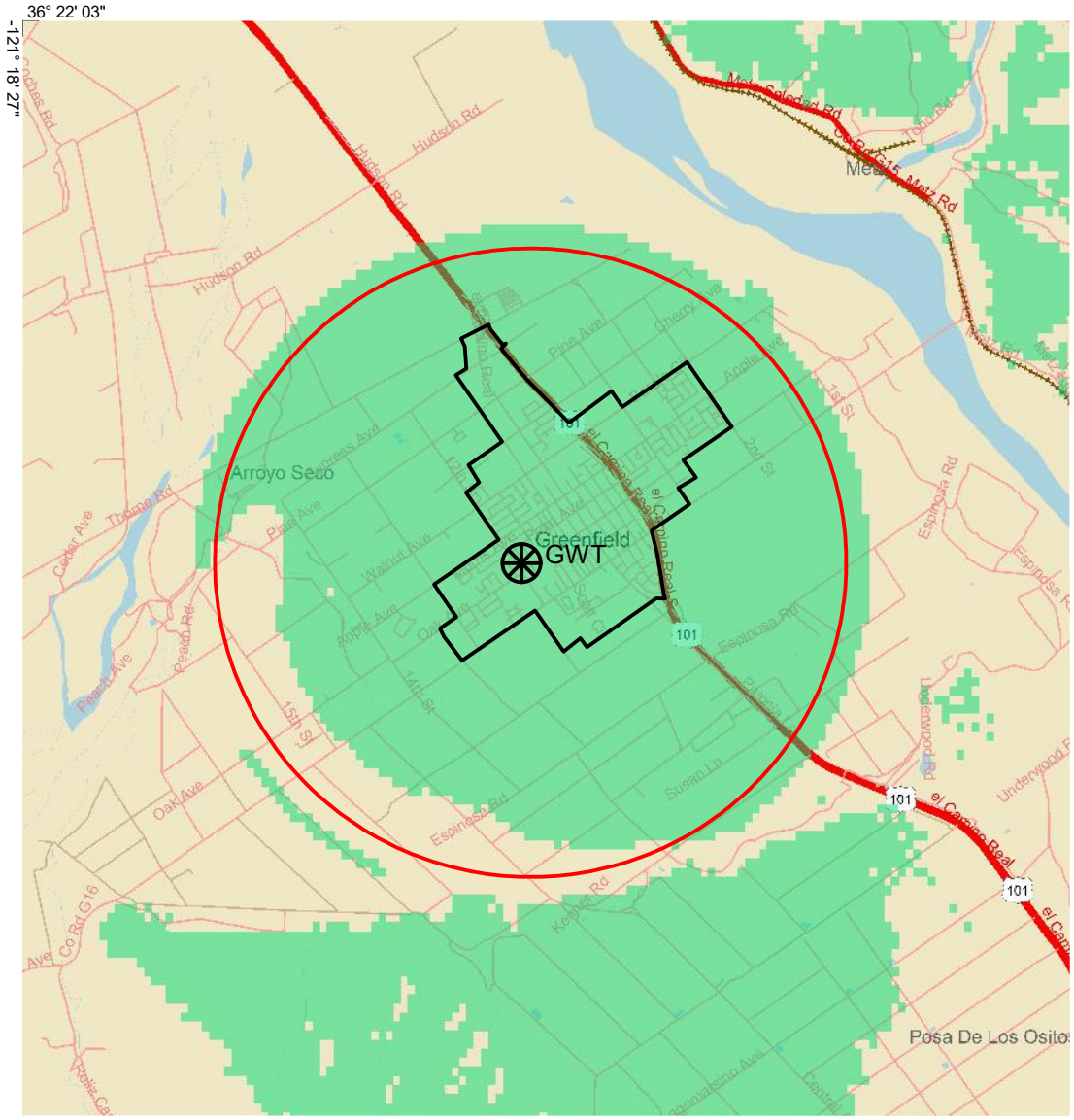
< -110.0dBm <0 dBm



RF Solutions

RAPTR Version 33.2.495
Wednesday, May 29, 2024 10:31:54
Project: Monterey County, California
MBP: 29149
Figure: 08 - City of Greenfield Portable Indoor 30 dB Talk-Back Coverage
Design: Bounded Area
Service: Portable, Talkback, Indoors, No SMA, P25 Phase 2
Engineer: J4R2
Map type - 1:75,000
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

< -110.0dBm <0 dBm



PROJECT MANAGEMENT / IMPLEMENTATION PLAN

The L3Harris Team

The details below describe the L3Harris team assigned to the project; it also reflects the various support and management functions that will provide critical program and technical assistance throughout the course of the project. Following is a brief description of the key team members and the roles that they will perform.

PROJECT MANAGER

The project manager's primary responsibility is the successful implementation, integration, optimization, and acceptance of the project. The project manager will manage all phases of the project from kickoff through final acceptance. He or she is responsible for ensuring the progress and quality of work, managing overall project cost, and processing any contract changes. All official communications regarding the project will be held between the project manager and Monterey County (hereafter referred to as the County).

After the contract is signed, the project manager will schedule an audit and health check of the current system in order to finalize the system upgrade requirements. Through the support of L3Harris' procurement, manufacturing, and order logistics functions, the project manager will ensure the ordering and shipping of materials and equipment. In addition, he or she will ensure that services are coordinated in support of the project schedule.

The project manager's responsibilities include but are not limited to the following:

- Managing all aspects of the project
- Setting up and managing the project team
- Conducting project activities according to the contract and within scope, quality, time, and cost constraints
- Developing a formal project schedule and updating it as necessary
- Reviewing, approving, and distributing all plan changes
- Managing risks
- Ensuring efficient project communications, team progress meetings, and issue resolution

SYSTEM ENGINEER

The system engineer will have full responsibility for the technical aspects of the system upgrade. He or she will be responsible for integrating L3Harris products with vendor products as required. The system engineer will also participate in all technical review meetings and provide technical support to the project manager.

The system engineer will oversee the system acceptance test, aka the Functional Acceptance Test Procedures (FATP). In addition, the system engineer will coordinate the development of as-built drawings and all technical documentation deliverables.

The system engineer's responsibilities include but are not limited to the following:

- Conduct system audit and document results
- Create an upgrade & transition plan
- Order, stage, configure, and test new equipment
- Provide instruction for proposed upgrades
- Oversee installation and power up of replacement equipment
- Perform network and network switching center (NSC) upgrades, and transition new equipment into service
- Execute Functional Acceptance Test Procedures

Project Execution

In order to fulfill this proposed implementation plan, the following task must be completed:

- An Interlocal Agreement must be in place:
  - The City of Greenfield, California, and Monterey County must have entered into an Interlocal Agreement allowing L3Harris to access and upgrade the Monterey P25 System for the purposes of City of Greenfield's shared usage. If City of Greenfield does not enter into an agreement with The City of Monterey for shared usage of the Monterey P25 System, then this contract will terminate and shall be considered null and void.

Once the above task is successfully executed, the L3Harris proposal and implementation teams will go through a 'contract hand-off' process. The proposal team coordinates with the assigned L3Harris implementation project manager and systems engineer to review the contractual obligations, key milestones, and other important issues. This document details the scope of work required for the project, through the following implementation phases:

- Kick-off
- Design
- Production
- Installation/Optimization
- Acceptance Testing
- Final Acceptance

KICK-OFF MEETINGS

The project manager will initiate the project implementation with a project kick-off meeting, followed by a preliminary design review. The L3Harris Team, and the County, will mutually agree on the timing of these activities.

The objectives of the meeting include:

- Introduction of all project participants
- Review the roles of the project participants
- Review the overall project scope and objectives
- Review the as-sold technical solution
- Review the current system status
- Review current sites' status
- Review the project schedule
- Review the migration strategy and functional test plans
- Review planned post-upgrade system configuration
- Schedule site surveys with the County, and/or site owner designated representatives

DETAILED DESIGN REVIEW (DDR)

The L3Harris Team uses the information obtained during the Kick-Off meeting, as-sold design review, site surveys, along with regulatory and engineering documentation, to deliver the final system design at the DDR. The design drawings and documentation are presented during the DDR with the County.

Once the DDR is agreed upon and finalized, the L3Harris team will place the order for equipment and services. L3Harris and Monterey County will mutually agree to initiate a change order at the conclusion of the DDR to capture any changes in price, system design, and schedule, if necessary.

Figure 1. Kick-off Meeting & Detailed Design Review Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
KICK-OFF MEETING, SITE SURVEYS, AND DESIGN ACTIVITIES			
Finalize an Interlocal Agreement with the City of Greenfield Once the above task is successfully executed, the L3Harris team will proceed with the following project tasks:		X	
Provide location in appropriate conference room or training facility		X	
Assemble project team and complete handoff from proposal team	X		
Assemble customer team for kick-off meeting		X	

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Provide a team and propose a schedule for site surveys	X		
Arrange access to sites and confirm site survey schedule		X	
Provide site-knowledgeable personnel (customer and site owner reps, as appropriate) to accompany the project team on site surveys		X	
Conduct site survey and provide recommendations	X		
Provide site plans and applicable electrical and layout plans		X	
Provide current tower and foundation drawings, along with a current mapping of installed antennas and cabling sufficient to complete a structural analysis as determined by the structural analysis firm		X	
Perform structural analysis on existing City of Greenfield water tower tank and provide results		X	
If the water tower fails load analysis, strengthen, or replace tower (L3Harris can provide quotes to strengthen (if possible) or replace the tower)		X	
Ensure grounding condition meets L3Harris' grounding standards		X	
File for FCC licensed frequencies that meet contour limits and fulfill the frequency plan in accordance with the project schedule		X	
Arrange for site lease for any non-customer-owned site (if applicable)		X	
DETAILED DESIGN REVIEW (DDR)			
Provide location to conduct DDR		X	
Assemble team to participate in DDR		X	
Present DDR material	X		
Approve the design following DDR meeting (within 5 business days)		X	
DETAILED DESIGN REVIEW DELIVERABLES			
System block diagrams	X		
List of deliverable equipment for each site	X		
Network connection plan and backhaul requirements	X		L3Harris will provide backhaul requirement; the County will be responsible for providing backhaul connection that

TASKS	L3HARRIS	THE COUNTY	COMMENTS
			meets L3Harris' requirements.
Water tower structural analysis		X	Due in 6 weeks after the kick-off meeting.
Water tower antenna placement drawings	X		
Antenna system drawings	X		
Coverage prediction maps	X		
Frequency plans		X	
Combiner plans	X		
Site plot drawings	X		
Shelter floor plan drawings	X		
Rack elevation drawings	X		
AC power and BTU requirements	X		
Preliminary cutover plan			
FATP & CCTP	X		
Project schedule	X		
Acquire FCC licensed frequencies that meet contour limits and fulfill the frequency plan, in accordance with the project schedule		X	

EQUIPMENT PROCUREMENT

Following the approval of DDR, the project team will procure material and schedule manufacturing using its Enterprise Resource Planning (ERP) system and processes. The L3Harris Customer Integration Center will receive orders to manufacture the equipment, as will our key suppliers/ vendors. Factory specifications will define the test for each individual rack of equipment.

After manufacturing and test, factory technicians and system engineers will assemble the equipment in the factory staging area. The system engineers will work with staging technicians to make all intra-rack connections for each NSC's equipment. Technicians will set the IP addresses and verify operation of the network.

Figure 2. Equipment Procurement & Production Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Insert equipment delivery dates into the ERP system	X		
Place orders with the factory and key suppliers/vendors	X		
Manufacture all infrastructure equipment	X		

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Stage equipment (assemble, configure, and test) in L3Harris Customer Integration Center in Lynchburg, VA	X		

EQUIPMENT DELIVERY, WAREHOUSING, AND INVENTORY

When manufacturing and staging are complete, the equipment will be prepared for delivery to the County. Each rack will be crated to protect the equipment in transit. The L3Harris Team engages appropriate freight carrier services to deliver the system to the address designated in the sales order. The system equipment will be warehoused, inventoried, and arranged by installation site at a County-provided location.

Figure 3. Equipment Delivery, Warehousing, and Inventory Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Provide temporary storage area near the point of installation		X	
Break down equipment and materials, pack, and ship to the County's storage area	X		
Inventory equipment and materials		X	
Arrange all equipment on a per site basis, ready for the installation teams	X		

L3HARRIS SUPPORTED SITE DEVELOPMENT

After DDR approval, the L3Harris Team places orders for site development materials and services. We coordinate shipments with the suppliers based on the project schedule to ensure parts and materials are available as needed at each site. Typically, the site development work occurs in parallel to radio system equipment manufacturing and staging. We then perform site development in accordance with L3Harris' best practices and industry standards.

Site development work included in this proposal is identified in Figure 4 below.

Figure 4. Site Development Overview. Balancing cost with long-term sustainability.

SITE NAME	WATER TOWER	SHELTER	GENERATOR	DC POWER PLANT
City of Greenfield	Existing	New (To be provided by the City)	Existing	New

ANTENNA SYSTEMS

In addition to the DC Power Plant material/install services, L3Harris' site development work also includes antenna installation services at the site. A key aspect of the infrastructure equipment work is installation of the new P25 antenna system.

For existing water tower, a structural analysis will determine whether it has existing mounting structures that are suitable for the installation of the new antenna systems. Additional mounting structures are often required, but can only be properly identified and quoted upon completing the structural analysis. The cost of these additional mounting structures is not included in this proposal. L3Harris can provide a quote to remediate the water tank through the change order process, or the County may elect to perform this work directly.

Monterey County must coordinate the proposed location of the new antenna system on the tower with the tower owner when they obtain a site lease and is responsible for obtaining assistance from co-located entities for interference testing and mitigation. It is recommended that the County must include language in the site lease agreements that all carriers co-located at the water tower agree to temporarily turn off transmitters to assist in testing and mitigation if interference is detected.

- Co-located transmitters could create intermodulation interference that could affect normal operation, coverage footprint, and audio quality for the radio system.
- If interference is detected, the city must provide coordination with the owners of the co-located transmitters for L3Harris to assist in interference mitigation.

For water tanks, antennas are mounted to existing or new mounting structures, as determined by the structural analysis results. The cables have ground kits that will be installed at the top, at the bottom as the cable leaves the tower or water tank, and at the end of the ice bridge before the cable entry port. Where applicable, grounding kits will be installed in the middle every 75 ft., so that there is no more than a 75-foot gap between grounds.

The tower crew runs coaxial cables down the water tower cable ladder, and onto the ice bridge terminating just inside the cable entry port.

After installation, we sweep the receive and transmit transmission lines separately, and one sweep from the transmission line to the transmit antenna(s) as a system to confirm that the line and antenna(s) were properly connected, with an Anritsu Site Master, or equivalent cable-testing device, on the appropriate frequency band(s) to ensure proper performance.

We then record the baseline test data and provide it to the County. A copy will remain on-site for future reference.

MONTEREY COUNTY-SUPPORTED SITE DEVELOPMENTS

Other than the aforementioned scope, L3Harris assumes that Monterey County will be responsible for other site civils preparations and developments, which may include the following, but not limited to adequate power (primary), grounding, network connectivity, equipment space, shelter construction etc. at the RF site for the new P25 infrastructure. The County will also be responsible for the decommissioning, removal, and disposal of legacy equipment from the existing site unless otherwise identified in the proposed radio system.

EXISTING WATER TOWER

As noted above, Monterey County shall perform a structural analysis to verify that the water tower has the capability to support the loads of the existing antennas and cables, as well as the loads for any new antennas and cables. The L3Harris Team reviews the tower configuration, recommends the best location to mount the new antennas, and presents this data at the DDR.

In the event that the water tower does not pass the structural analysis, action must be taken by the County in the form of one or more of the following: remediate the water tower to meet structural requirements, find a new site location, or build a new tower. L3Harris will be available on a contract basis to help resolve the issue through the change order process.

NEW SHELTER (TO BE PROVIDED BY THE COUNTY)

The City-provided shelter will need to be physically inspected and floor space calculations performed to verify that there is adequate space to install new equipment racks. L3Harris will also review the existing electrical power, HVAC, and standby power systems, and discuss necessary upgrades at the DDR.

In the event that the shelter does not provide; adequate space, weather resistance, cannot carry the weight load of the equipment therein, HVAC, or standby power the customer will need to remediate the shelter. In the event that existing electrical power is insufficient in the ability to handle the new draw, the customer will need to take action. L3Harris will be available on a contract basis to help resolve the issue through the change order process.

MONTEREY COUNTY-SUPPORTED SITE PREPARATION

L3Harrris assumes that the County will be responsible for all site civils preparations and developments, which may include the following, but not limited to adequate power (primary and backup), grounding, network connectivity, equipment space, shelter remediations (if needed) etc. at sites and dispatch locations for the new VIDA core and P25 infrastructure.

The County will also be responsible for the installation, configuration, and optimization of Site 24: Multisite – Lobos Ridge at its final designated location before installation of the new VIDA core and P25 infrastructure takes place. Should any issue arise during the installation of Lobos Ridge site, L3Harris will be available on a contract basis to help resolve the issue through the change order process.

NEW CORE INSTALLATION, UPGRADE, AND TRANSITION

With the replacement equipment in market, the L3Harris installation team(s) will install the new equipment and upgrade software at the site locations, as noted in the Detailed Design Review (DDR).

Systems for hardware replacement and installation include:

- Core Network Switching Center Upgrade/Replacement
- Dispatch Centers & Radio Shop Network Equipment Upgrade/Replacement
- Replace existing SDP 2.0 H/W platform with SDP 3.0 for Existing Symphony Consoles

Systems requiring software only upgrade include:

- P25 Radio System/Sites Upgrade
- Existing Symphony Consoles O/S Upgrade to Windows 10
- Existing Network Sentry O/S Upgrade to Windows 10

Installation plans will be developed during the detailed planning phase of the project, and will coordinate all activities of the project team, minimizing conflicts and ensuring that system implementation proceeds efficiently. Where existing operational communications equipment co-exists with the installation of new equipment, the project team will take great care to ensure that there is little or no disruption in service.

Figure 5. General Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Coordinate with federal, state, and local government agencies, as required		X	
Provide access to all buildings and sites, including temporary ID badges for L3Harris' project team		X	
Provide parking permits for L3Harris project team for any restricted parking areas		X	
Provide adequate road access for delivery vehicles		X	
Arrange for temporary parking to off-load equipment at all buildings and sites		X	
Clean up site and remove all L3Harris' installation debris	X		
Remove any hazardous material found on site		X	
Install materials in accordance with industry and L3Harris standards	X		
Provide backhaul requirements to the County	X		
Provide backhaul which meets the L3Harris' backhaul requirements		X	
Complete all site preparations and developments (if needed)		X	
Schedule and conduct a system baseline test	X		System Baseline Test will validate any unknown changes from last system upgrade. Any changes will be addressed in the DDR and will be resolved in the

TASKS	L3HARRIS	THE COUNTY	COMMENTS
			Change Order Process.
Install, configure, and optimize Lobos Ridge site at its designated location prior to installation of the new VIDA core and P25 infrastructure		X	

Figure 6. Core Upgrade Tasks

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Provide floor space & power for new equipment racks		X	
Backup all the UAS, KMF, & RNM Databases	X		
Backup all the NSS (VNIC & HA), RSMPro (SMS, DM Repository, AW), & ISSI Personality/Configuration files	X		
Archive AW data	X		
Verify that all database backups are completed	X		
Deliver equipment to NSC locations	X		
Install new Servers in Racks/Cabinets	X		
Install new NSCs and Connect to Network	X		
Migrate databases from Old NSC to New NSC	X		
Confirm call processing with new primary NSCs	X		
Restart the UAS VM and ensure provisioning is working between devices within the primary NSC	X		
Complete post upgrade tests & Burn-In for a minimum of 24 hrs	X		
Conduct post Primary NSC upgrade meeting – proceed decision point.	X		
Provide approval to proceed to secondary NSC		X	
Upgrade secondary NSCs & Test	X		
Remove old NSC from Network and Power off	X		

MONTEREY COUNTY SITES AND DISPATCH INSTALLATION, UPGRADE, AND SYSTEM OPTIMIZATION

Following the Network Core upgrade and transition, the system engineer will work with the on-site installation team to upgrade the sites and dispatch locations. Details of the equipment proposed for each location are noted in the System Description. System optimization will be performed to verify the overall function of the new system.

Figure 7. Monterey County Sites and Dispatch Installation, Upgrade Tasks, & System Optimization

TASKS	L3HARRIS	THE COUNTY	COMMENTS
SITES UPGRADE			
Upgrade O/S to WIN 10 on (12) existing Network Sentry's	X		
At Pebble Beach RF site, install and configure an existing County-owned MPLS V2 router	X		
At Bryan Canyon, Williams Hills, and King City sites, configure existing routers' Ethernet ports, connect them to County-provided Ethernet backhaul ports, and disconnect the existing T1 ports	X		To ensure the new Ethernet backhaul meet L3Harris' requirements, Monterey County will need to provide RFC 2544 test data, prior to the start of site commissioning / optimization.
Provide personality refresh & channel alignment to MASTR V base stations at applicable sites location	X		
Perform Site High Level Functional Test	X		
DISPATCH CENTERS & RADIO SHOP UPGRADE			
Install New Routers and Switches (at dispatch center & the radio shop locations only)	X		
Replace existing SDP 2.0 H/W platform with SDP 3.0 for a total of (26) existing Symphony dispatch consoles	X		
Upgrade O/S to WIN 10 on a total of (13) VIP dispatch consoles	X		
Verify proper consoles operation	X		
Provide upgrade to the County-provided logging recorder system and its supporting tools		X	
SYSTEM OPTIMIZATION			
Verify P25 system levels and parameters are set	X		
Verify system database is installed and operating correctly	X	X	
Verify proper dispatch operation	X	X	
Verify proper P25 system functional operation	X	X	
Verify proper network switching operation	X	X	

CITY OF GREENFIELD SITE INSTALLATION

For City of Greenfield, upon completion of the tower work, installation crews install the base-station, and associated equipment. The MASTR V P25 trunked base station, microwave, and associated equipment typically mounts in 86-inch standard aluminum EIA 19-inch open-frame racks or EIA 19-inch

enclosed cabinets. The RF connections extend to the coaxial cables using appropriately sized jumper cables.

L3Harris assumes that the County-provided shelter will accommodate the height of these racks and allow them to position the desired 36 inches of free aisle space (in front and in the rear) with two (2) empty cable entry ports. Racks and cabinets are anchored to the floor using at least four anchor points.

Once the infrastructure racks are secured, we ground and connect them to power, and technicians verify proper levels and settings, preparing the site for the acceptance test.

L3Harris will work with the County personnel and/or their representatives to prepare for their participation in acceptance testing. After the test is complete, the installation team records the alignment and test data and provides copies to Monterey County. Copies of the site alignment and test data will be available at the site.

Figure 8. City of Greenfield Site Installation Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Arrange for access to third party collocated site		X	
Negotiate and obtain lease (or modify existing lease) for third party co-location site, ensuring the site lease includes required space on the water tower, cable ice bridge, and water tower cable ladders to support new cable runs, space-in compound for new shelter		X	
Ensure co-location agreements address site compound space requirements to include confirmation that no subsurface obstructions preclude running conduits for power or leased circuits, as well as running lines between City of Greenfield's shelter, generator, and fuel tank		X	
Perform water tower structural analysis and provide results		X	
Provide existing site plans		X	
Ensure grounding conditions meet L3Harris' grounding standards		X	
Conduct site survey post kickoff meeting and provide recommendations	X		
Identify specific water tower attachment points to mount new antennas per the system design	X		
Confirm availability of water tower attachment points for L3Harris antennas		X	
Provide space on existing water tower to mount new system antennas at L3Harris-specified locations (defined in site lease)		X	
Ensure adequate space is available on cable ice bridge, and water tower cable ladders, to support new cable runs		X	

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Install new antenna(s) using appropriate side arms and appropriate mounting hardware	X		
Install antenna coax, connectors, and jumpers, using cable clamps to properly secure cable to water tower, and add grounding kits at the top, bottom, and on ice bridge	X		
Install a new tower top amplifier	X		
Install antenna lightning protection devices on each transmission line LMR run after it enters shelter via cable entry port; ground device to main ground bus bar	X		
Tag and identify each new antenna line	X		
Sweep test each new antenna line in accordance with L3Harris' "Transmission Line Analysis (Antenna Sweep) Procedure"	X		
Provide floor space in new RF shelter for new equipment racks used in the new design		X	The County must provide shelter floor space for three (3) open racks of equipment.
Provide adequate shelter/equipment room utility AC electrical power, single-point ground system HVAC, and backup generator power		X	
Provide empty cable entry ports for new cable runs		X	
Upgrade existing interior ground system that meets L3Harris' grounding standards		X	
Responsible for the cost to remediate all grounding at shelter, tower, compound, and facilities to meet L3Harris' grounding standards (upon request, L3Harris can provide quote to remediate grounding conditions)		X	
Provide cable ladder and overhead electrical connections for new equipment row		X	
Prepare and submit electrical permits on behalf of the County	X		
Install new DC power plant and wire to racks	X		

INFRASTRUCTURE OPTIMIZATION

Upon installation of infrastructure equipment, the system engineer(s) works with the onsite technicians to optimize the equipment in preparation for acceptance testing.

Simulcast – Per simulcast cell, includes verify launch timing, verify timing drive test, making iterative adjustments, repeat timing drive test, if needed, and verify configuration, test voter, test network latency, verify network switches, and dispatch console operation.
Multi-site – Includes set up site adjacency in the VNIC, build roaming personality, drive test roaming and handoff, and finalize roaming personalities.
L3Harris conducts a preliminary acceptance test to determine that the systems are fully optimized and ready for the acceptance test with the County.

Figure 9. System Optimization Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Prepare all installed sites for site inspections	X		
Provide frequencies to use for optimization and testing (if frequencies are currently in use in existing system)		X	
Verify P25 system levels and parameters are set	X		
Verify P25 system alarm and system monitoring system are operational	X		
Verify system database is installed and operating correctly	X		
Verify proper P25 functional operation	X		

ACCEPTANCE TESTING

Systems functional acceptance testing will be performed according to the agreed upon FATP and system contract. The project team will notify the County when installation and initial testing are complete, and the system is ready for acceptance testing.

The system engineer will provide the County with a copy of the FATP, contains a short description, test methodology, and record form for logging results and acceptance signatures for each test. A punch list will be available to document any issues found, which the team will work to quickly resolve. Upon satisfactory completion of the FATP and punch list, the project manager will present the system acceptance documentation to the County. With the County's approval, Coverage Characterization will begin.

The Coverage Characterization Test (CCTP) follows the FATP and will measure / characterize the coverage of for the City of Greenfield service area. Upon completion of the CCTP, a Coverage Characterization report will be provided to the City.

L3Harris will submit initial system acceptance documentation for Monterey County to sign, marking the successful conclusion of acceptance testing.

Figure 10. Acceptance Testing Responsibility Matrix

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Provide appropriate team members to participate in acceptance tests		X	
Inspect the installed site, noting discrepancies on a punch list	X		

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Submit site inspection results	X		
Approve site inspection results		X	
Perform functional ATP	X		FATP is written to test only the new SR11 NSCs, Symphony consoles with new SDP 3.0 platform, City of Greenfield, along with three (3) County-selected sites from each RF cell.
Submit functional ATP results	X		
Sign approval of functional ATP results (within 5 business days)		X	
Provide team members to participate in coverage characterization test		X	
Provide test vehicles and drivers for coverage characterization acceptance testing	X		
Provide new test radios for automatic coverage tests as defined in the CCTP		X	
Perform automated coverage test of P25 system per system contract	X		
Submit CCTP results	X		
Submit letter of system acceptance	X		
Sign letter of system acceptance		X	

FINAL ACCEPTANCE

Upon the completion of functional test and submission of the final drawing package, the project manager submits the final system acceptance letter for the County to sign.

Figure 11. Final Acceptance Responsibility Matrix

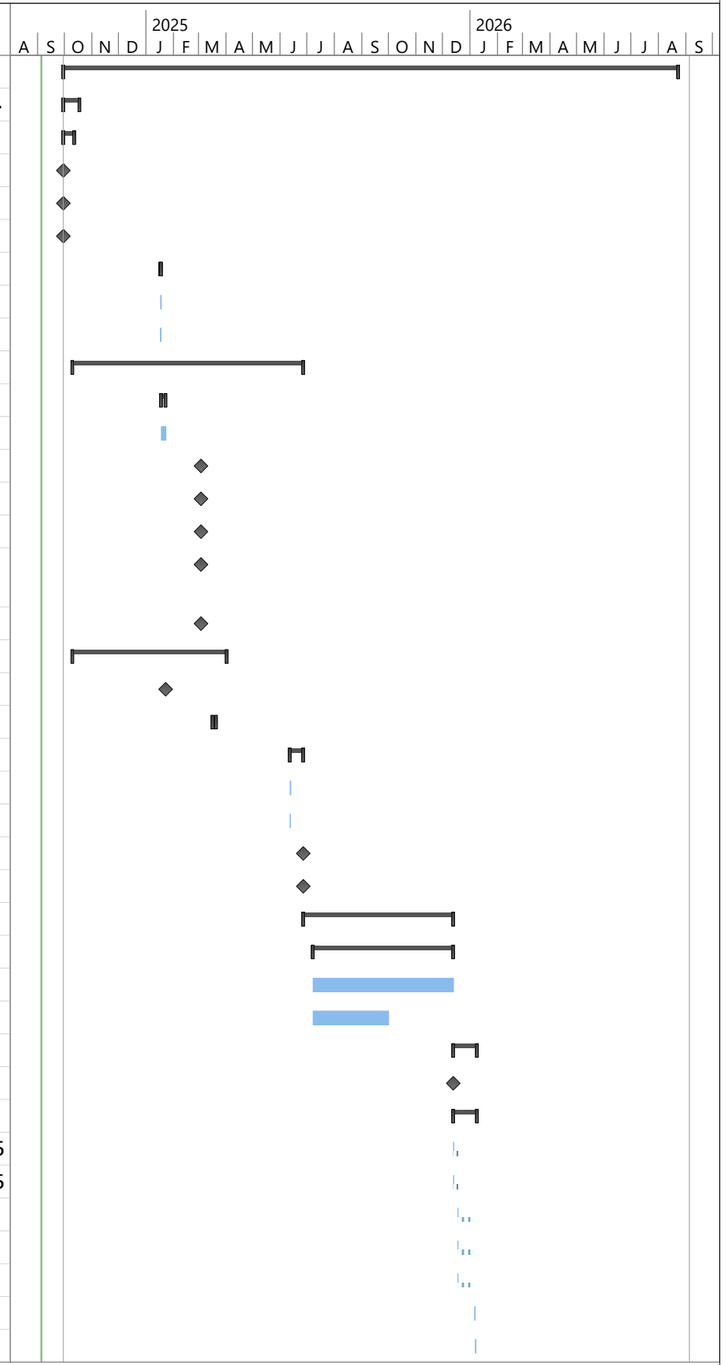
TASKS	L3HARRIS	THE COUNTY	COMMENTS
Collect & Archive System Configurations	X		
Removal of decommissioned legacy network and site infrastructure equipment	X		
Submit final drawing package	X		
Submit letter of final system acceptance	X		
Provide warranty and contact information	X		

TASKS	L3HARRIS	THE COUNTY	COMMENTS
Meet with L3Harris to review warranty, contact procedures, and system support		X	
Accept final drawing package		X	
Sign letter of final system acceptance		X	

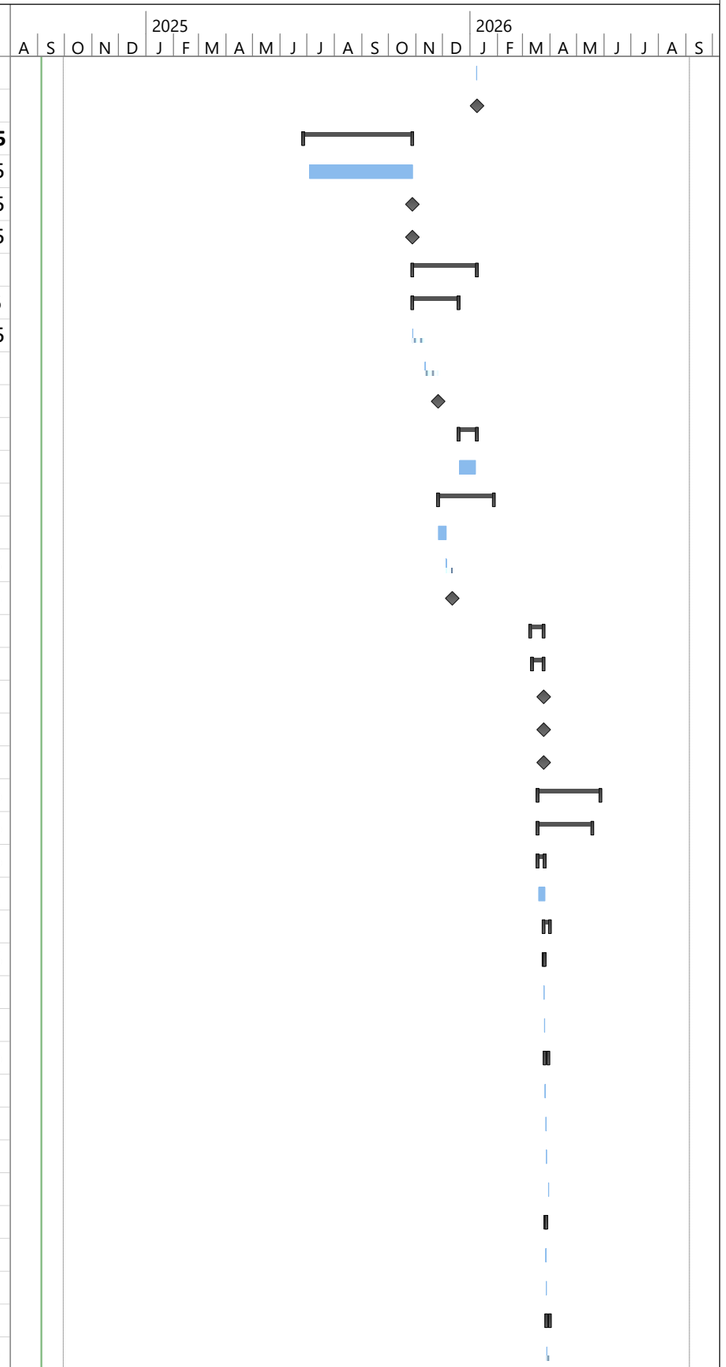
PRELIMINARY PROJECT SCHEDULE

A detailed project schedule will be prepared during the design phase and presented as part of the Detailed Design Review. The Project Schedule included with this proposal represents a high-level project schedule following contract award. L3Harris is committed to working with the County throughout the project to identify potential schedule efficiencies in order to reduce the overall project duration.

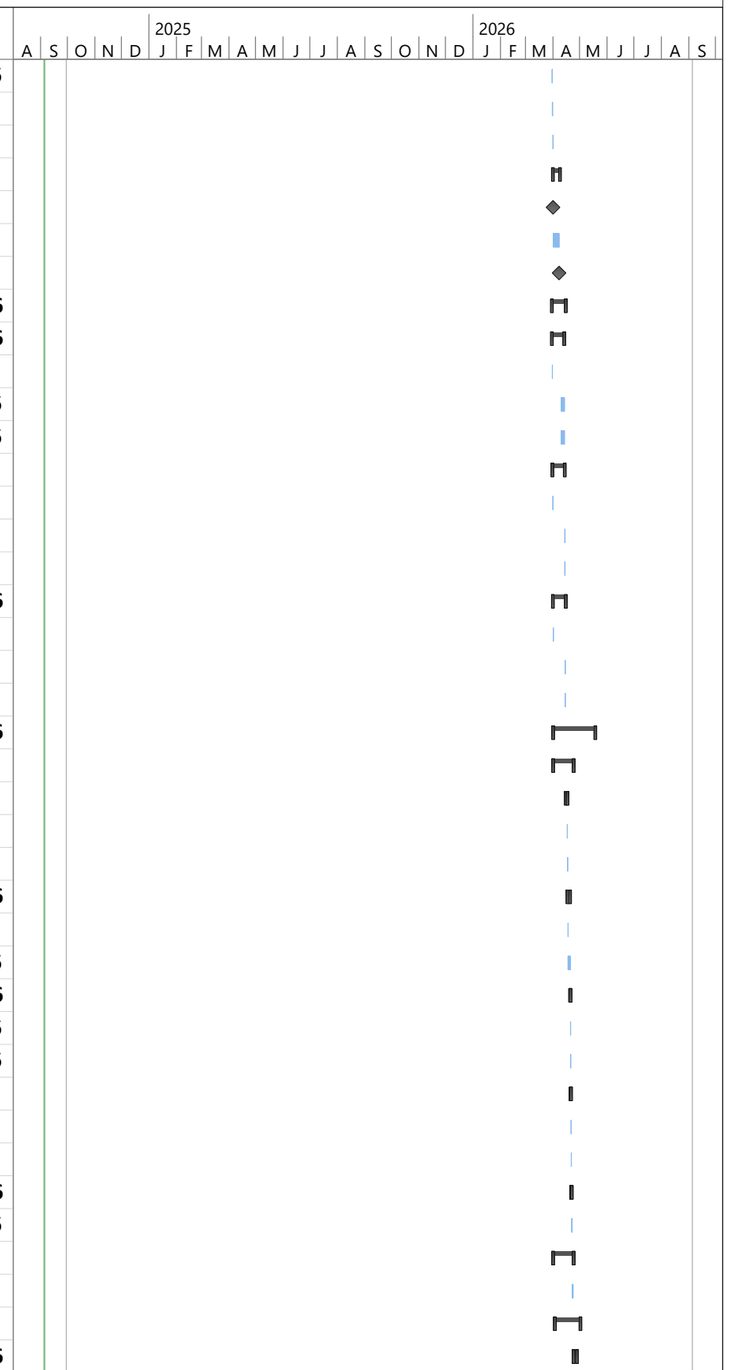
Name	Duration	Start	Finish
<Monterey County, CA SR11 System Upgrade & City of Greenfield Site Add>	**468 days**	**Mon 9/30/24**	**Sun 8/23/26**
L3Harris Internal Startup	**14 days**	**Mon 9/30/24**	**Thu 10/17/24**
Contract Start	**10 days**	**Mon 9/30/24**	**Fri 10/11/24**
Contract Signed	0 days	Mon 9/30/24	Mon 9/30/24
City of Greenfield to Obtain an Interlocal Agreement with Monterey County	0 days	Mon 9/30/24	Mon 9/30/24
Contract Execution Billing Milestone	0 days	Mon 9/30/24	Mon 9/30/24
Hold Project Kickoff Meeting	**1 day**	**Thu 1/16/25**	**Fri 1/17/25**
Conduct Project Kickoff Meeting	1 day	Thu 1/16/25	Fri 1/17/25
Monterey County to Attend Project Kickoff Meeting	1 day	Thu 1/16/25	Fri 1/17/25
Detailed Design Review	**174 days**	**Wed 10/9/24**	**Thu 6/26/25**
Site Survey	**2 days**	**Fri 1/17/25**	**Wed 1/22/25**
Perform Site Survey at Existing Sites	2 days	Fri 1/17/25	Wed 1/22/25
Site Preparation & Development	**0 days**	**Mon 3/3/25**	**Mon 3/3/25**
Monterey County to Provide All Sites, Towers, and Foundation Drawings For Existing Sites (if applicable)	0 days	Mon 3/3/25	Mon 3/3/25
Monterey County to Acquire Site Leases (if applicable)	0 days	Mon 3/3/25	Mon 3/3/25
Monterey County/City of Greenfield to Provide Site, Water Tower, Water Tower Structual Analysis, and Foundation Drawings for the Existing Site	0 days	Mon 3/3/25	Mon 3/3/25
Monterey County/City of Greenfield to Acquire Site Leases (if applicable)	0 days	Mon 3/3/25	Mon 3/3/25
Initial Design Review	**113 days**	**Wed 10/9/24**	**Tue 4/1/25**
Vendor Survey Results Milestones	**0 days**	**Wed 1/22/25**	**Wed 1/22/25**
Finalize Initial Design Review	**4 days**	**Mon 3/17/25**	**Thu 3/20/25**
Detailed Design Review (DDR) with Monterey County	**11 days**	**Wed 6/11/25**	**Thu 6/26/25**
Conduct Detailed Design Review (DDR) Meeting	1 day	Wed 6/11/25	Thu 6/12/25
Monterey County & City of Greenfield to Attend Detailed Design Review (DDR) Meeting	1 day	Wed 6/11/25	Thu 6/12/25
Detailed Design Review Approved by Monterey County & City of Greenfield	0 days	Thu 6/26/25	Thu 6/26/25
Detailed Design Review Billing Milestone	0 days	Thu 6/26/25	Thu 6/26/25
Non-Standard Material Purchase Order Execution	**116 days**	**Fri 6/27/25**	**Fri 12/12/25**
Non Standard Material Tracking and Delivery	**110 days**	**Tue 7/8/25**	**Fri 12/12/25**
DC Power Plant System Delivered to the field for Civil Installation	22 wks	Tue 7/8/25	Fri 12/12/25
Antenna System Delivered to the field for Civil Installation	60 days	Tue 7/8/25	Tue 9/30/25
City of Greenfield Civil Development	**12 days**	**Fri 12/12/25**	**Thu 1/8/26**
All City of Greenfield-Supported Site Preparation & Development Complete	0 days	Fri 12/12/25	Fri 12/12/25
L3Harris-Supported Site Preparation & Development	**12 days**	**Fri 12/12/25**	**Thu 1/8/26**
Install DC Plant (rectifiers)	3 days	Fri 12/12/25	Wed 12/17/25
Install batteries	3 days	Fri 12/12/25	Wed 12/17/25
Install coax lines and antennas	6 days	Wed 12/17/25	Mon 1/5/26
Install TTA	6 days	Wed 12/17/25	Mon 1/5/26
Perform coax line and antenna sweep test	6 days	Wed 12/17/25	Mon 1/5/26
Perform ATP with Vendors	1 day	Mon 1/5/26	Tue 1/6/26
Provide red-line drawing to L3H	1 day	Tue 1/6/26	Wed 1/7/26



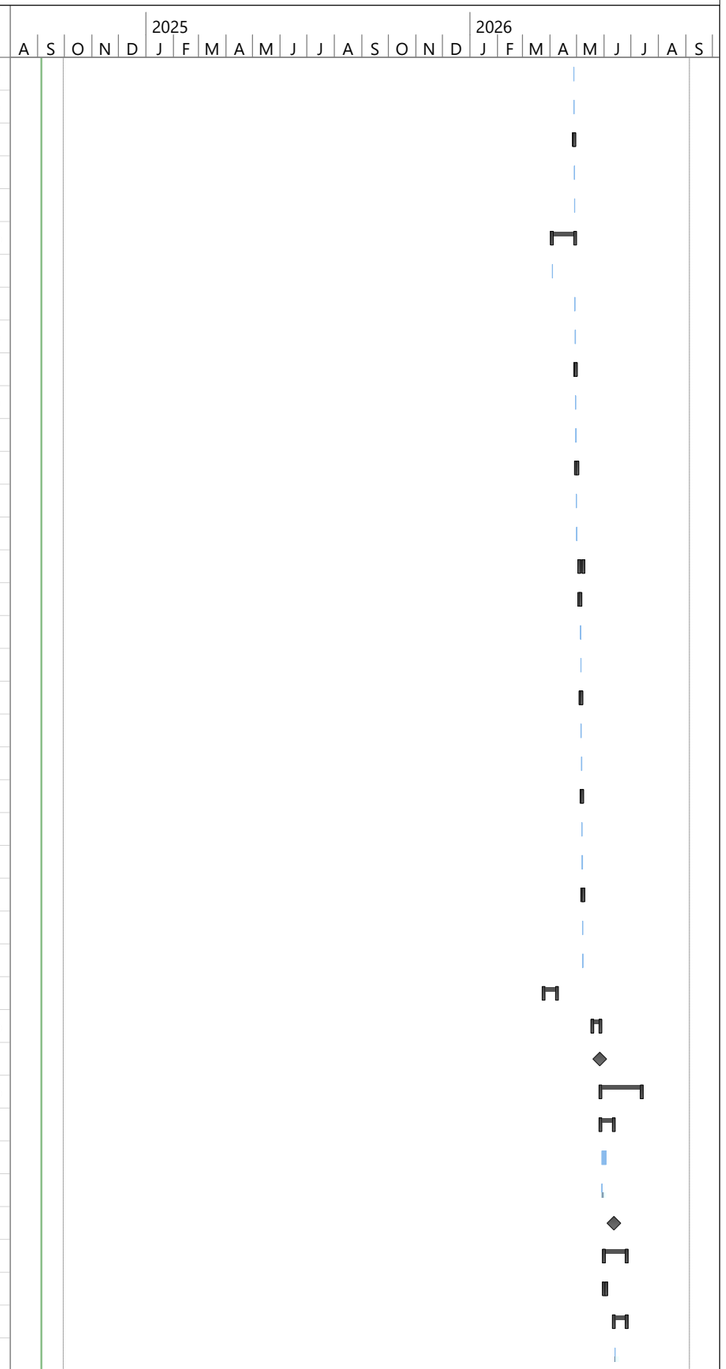
Name	Duration	Start	Finish
Punch list items identified and resolved	1 day	Wed 1/7/26	Thu 1/8/26
City of Greenfield Civil Development Complete	0 days	Thu 1/8/26	Thu 1/8/26
LMR Standard Material Orders	**85 days**	**Thu 6/26/25**	**Mon 10/27/25**
Track Standard Material and Delivery	4 mons	Thu 7/3/25	Mon 10/27/25
LMR Standard Materials Delivered at Customer Integration Center (CIC)	0 days	Mon 10/27/25	Mon 10/27/25
L3H Procurement of Equipment Billing Milestone	0 days	Mon 10/27/25	Mon 10/27/25
LMR Equipment Factory Production	**43 days**	**Mon 10/27/25**	**Thu 1/8/26**
LMR Equipment Assembly and Staging	**35 days**	**Mon 10/27/25**	**Thu 12/18/25**
Assemble LMR Standard Material	2 wks	Mon 10/27/25	Mon 11/10/25
Clone the new SR11 Network Switching Center (NSC)	2 wks	Mon 11/10/25	Tue 11/25/25
Equipment Staging at Factory Billing Milestone	0 days	Tue 11/25/25	Tue 11/25/25
Internal Factory Acceptance Testing (IFAT)	**8 days**	**Fri 12/19/25**	**Thu 1/8/26**
Perform Internal Factory Acceptance Test (IFAT)	5 days	Fri 12/19/25	Tue 1/6/26
Cutover Planning	**35 days**	**Wed 11/26/25**	**Tue 1/27/26**
Finalize Cutover Plan (Migration Strategy, etc.)	5 days	Wed 11/26/25	Thu 12/4/25
Monterey County to Review the Core Cutover Plan	5 days	Thu 12/4/25	Thu 12/11/25
Core Cutover Plan Approved by Monterey County	0 days	Thu 12/11/25	Thu 12/11/25
Equipment Delivery	**11 days**	**Mon 3/9/26**	**Tue 3/24/26**
System Tear Down and Shipping	**9 days**	**Wed 3/11/26**	**Tue 3/24/26**
Inventory of Equipment at Monterey County's Warehouse	0 days	Tue 3/24/26	Tue 3/24/26
Infrastructure Equipment Shipment Billing Milestone	0 days	Tue 3/24/26	Tue 3/24/26
All Monterey County Site Preparation & Development Complete	0 days	Tue 3/24/26	Tue 3/24/26
LMR Installation and Optimization	**50 days**	**Wed 3/18/26**	**Wed 5/27/26**
System Infrastructure Installation and Optimization	**44 days**	**Wed 3/18/26**	**Mon 5/18/26**
System Baseline Test	**6 days**	**Wed 3/18/26**	**Wed 3/25/26**
Perform System Baseline Testing	5 days	Thu 3/19/26	Wed 3/25/26
Primary & Secondary Network Switching Center (NSC)	**5 days**	**Tue 3/24/26**	**Tue 3/31/26**
Turn-Down Legacy Secondary Network Switching Center (NSC) - ITD	**1 day**	**Tue 3/24/26**	**Wed 3/25/26**
Power Down SR10A.1 Secondary Core	0.5 days	Tue 3/24/26	Wed 3/25/26
Remove SR10A.1 Secondary Core	0.5 days	Wed 3/25/26	Wed 3/25/26
Install New Secondary Network Switching Center (NSC) - ITD	**2.5 days**	**Wed 3/25/26**	**Mon 3/30/26**
Install New Secondary SR11 Premier Location HA Core	1 day	Wed 3/25/26	Thu 3/26/26
NSC Secondary Power-Up	0.5 days	Fri 3/27/26	Fri 3/27/26
Perform Health Check on Secondary Core	0.5 days	Fri 3/27/26	Fri 3/27/26
Failover to New SR11 Secondary Core	0.5 days	Mon 3/30/26	Mon 3/30/26
Turn-Down Legacy Primary Network Switching Center (NSC) - ECD-911 Primary Dispatch	**1 day**	**Thu 3/26/26**	**Fri 3/27/26**
Power Down SR10A.1 Primary Core	0.5 days	Thu 3/26/26	Fri 3/27/26
Remove SR10A.1 Primary Core	0.5 days	Fri 3/27/26	Fri 3/27/26
Install New Primary Network Switching Center (NSC) - ECD-911 Primary Dispatch	**2 days**	**Fri 3/27/26**	**Tue 3/31/26**
Install New Primary SR11 Premier Location HA Core	1 day	Fri 3/27/26	Mon 3/30/26



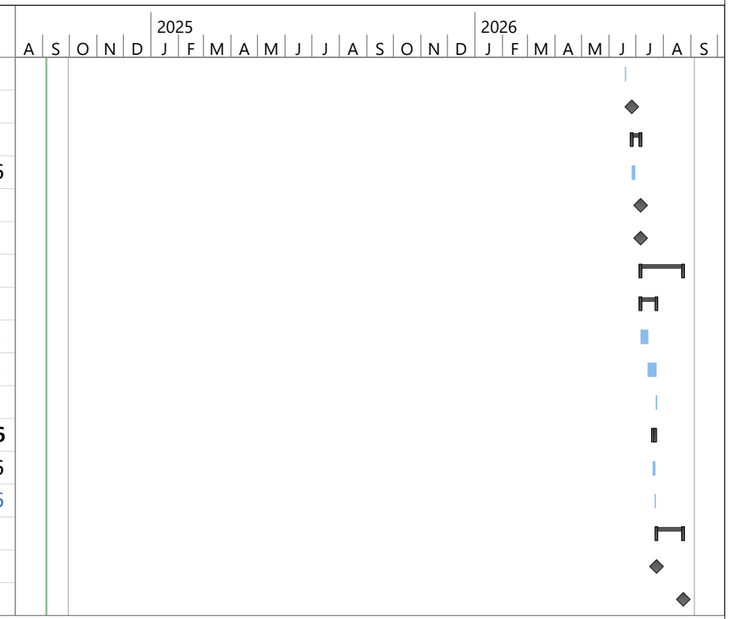
Name	Duration	Start	Finish
NSC Primary Power-Up	0.5 days	Mon 3/30/26	Mon 3/30/26
Perform Health Check on Primary Core	0.5 days	Tue 3/31/26	Tue 3/31/26
Failover to New SR11 Primary Core	0.5 days	Tue 3/31/26	Tue 3/31/26
Core Cutover Execution	**6 days**	**Tue 3/31/26**	**Wed 4/8/26**
Notified Users of Cutover time	0 days	Tue 3/31/26	Tue 3/31/26
Cutover to the New SR11 Cores	5 days	Wed 4/1/26	Tue 4/7/26
Cutover to the New SR11 Cores Complete	0 days	Tue 4/7/26	Tue 4/7/26
Existing Consoles Upgrade at Dispatch Centers & Site	**11.75 days**	**Mon 3/30/26**	**Wed 4/15/26**
ECD-911 Primary Dispatch Center	**10 days**	**Mon 3/30/26**	**Mon 4/13/26**
Replace Existing Router/Switch with (2) Redundant SAR/SAS	0.5 days	Mon 3/30/26	Tue 3/31/26
Replace Existing SDP 2.0 H/W platform with SDP 3.0 for (23) Existing Symphony Consoles	2 days	Fri 4/10/26	Mon 4/13/26
Turnup and Optimize Consoles & New Networking Equipment	2 days	Fri 4/10/26	Mon 4/13/26
Site 32 Backup Dispatch Center	**10 days**	**Tue 3/31/26**	**Tue 4/14/26**
Replace Existing Router/Switch with (2) Redundant SAR/SAS	0.5 days	Tue 3/31/26	Tue 3/31/26
Replace Existing SDP 2.0 H/W platform with SDP 3.0 for (2) Existing Symphony Consoles	0.5 days	Tue 4/14/26	Tue 4/14/26
Turnup and Optimize Consoles & New Networking Equipment	0.5 days	Tue 4/14/26	Tue 4/14/26
Site 30 Radio Shop	**10.75 days**	**Tue 3/31/26**	**Wed 4/15/26**
Replace Existing Router/Switch with (1) Non-Redundant SAR/SAS	0.25 days	Tue 3/31/26	Wed 4/1/26
Replace Existing SDP 2.0 H/W platform with SDP 3.0 for (1) Existing Symphony Console	0.25 days	Tue 4/14/26	Tue 4/14/26
Turnup and Optimize Consoles & New Networking Equipment	0.25 days	Tue 4/14/26	Tue 4/14/26
Networking Equipment Replacement at Existing Sites	**33.75 days**	**Wed 4/1/26**	**Mon 5/18/26**
Trunked Multi-Site	**17 days**	**Wed 4/1/26**	**Fri 4/24/26**
Site 3: Lewis Road | 5 CH | VHF	**1.75 days**	**Wed 4/15/26**	**Fri 4/17/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Thu 4/16/26	Thu 4/16/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Fri 4/17/26	Fri 4/17/26
Site 4: Bryant Canyon | 4 CH | VHF	**0.75 days**	**Fri 4/17/26**	**Mon 4/20/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Fri 4/17/26	Fri 4/17/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Fri 4/17/26	Mon 4/20/26
Site 5: Williams Hill | 4 CH | 700 MHz	**0.75 days**	**Mon 4/20/26**	**Mon 4/20/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Mon 4/20/26	Mon 4/20/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Mon 4/20/26	Mon 4/20/26
Site 6: King City | 4 CH | VHF	**0.75 days**	**Tue 4/21/26**	**Tue 4/21/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Tue 4/21/26	Tue 4/21/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Tue 4/21/26	Tue 4/21/26
Site 7: Lobos Ridge | 4-CH | 700 MHz	**0.5 days**	**Tue 4/21/26**	**Wed 4/22/26**
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Tue 4/21/26	Wed 4/22/26
Site 25: City of Greenfield | 4-CH | 700 MHz	**17 days**	**Wed 4/1/26**	**Fri 4/24/26**
Turn-Up, Perform Site Alignment, & Pre-Test Site Function	1 day	Wed 4/22/26	Thu 4/23/26
VHF Simulcast Cell-01	**20.75 days**	**Fri 4/3/26**	**Fri 5/1/26**
Site 11: 911 Center | DCP | 7-CH	**1.75 days**	**Fri 4/24/26**	**Mon 4/27/26**



Name	Duration	Start	Finish
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Mon 4/27/26	Mon 4/27/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Mon 4/27/26	Mon 4/27/26
Site 12: Laguna Seca | 7-CH	**0.75 days**	**Tue 4/28/26**	**Tue 4/28/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Tue 4/28/26	Tue 4/28/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Tue 4/28/26	Tue 4/28/26
Site 13: Pebble Beach Corp Yard| DCP | 7-CH	**18.25 days**	**Fri 4/3/26**	**Wed 4/29/26**
Install One (1) County-provided 7705 Router	0.5 days	Fri 4/3/26	Fri 4/3/26
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Tue 4/28/26	Tue 4/28/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Wed 4/29/26	Wed 4/29/26
Site 14: MCW | 7-CH	**0.75 days**	**Wed 4/29/26**	**Thu 4/30/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Wed 4/29/26	Wed 4/29/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Wed 4/29/26	Thu 4/30/26
Site 15: Penon Peak | 7-CH	**1.75 days**	**Thu 4/30/26**	**Fri 5/1/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Thu 4/30/26	Thu 4/30/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Thu 4/30/26	Thu 4/30/26
700 MHz Simulcast Cell-02	**5 days**	**Mon 5/4/26**	**Fri 5/8/26**
Site 21: 911 Center | DCP | 8-CH	**1.75 days**	**Mon 5/4/26**	**Tue 5/5/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Tue 5/5/26	Tue 5/5/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Tue 5/5/26	Tue 5/5/26
Site 22: La Mesa | DCP | 8-CH	**0.75 days**	**Tue 5/5/26**	**Wed 5/6/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Tue 5/5/26	Tue 5/5/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Wed 5/6/26	Wed 5/6/26
Site 13: Laguna Seca | DCP | 7-CH	**0.75 days**	**Wed 5/6/26**	**Thu 5/7/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Wed 5/6/26	Wed 5/6/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Wed 5/6/26	Thu 5/7/26
Site 23: Mt. Toro | 8-CH	**1.75 days**	**Thu 5/7/26**	**Fri 5/8/26**
Upgrade Existing NWS Gen IV to WIN 10	0.25 days	Thu 5/7/26	Thu 5/7/26
Upgrade MASTR V Base Station to SR11.1 SW & Pre-Test Site Function	0.5 days	Thu 5/7/26	Thu 5/7/26
Coverage Testing Readiness	**11 days**	**Wed 3/25/26**	**Wed 4/8/26**
Acceptance Testing Readiness	**6 days**	**Tue 5/19/26**	**Wed 5/27/26**
Installation (System) Billing Milestone	0 days	Tue 5/26/26	Tue 5/26/26
System Acceptance	**31.5 days**	**Thu 5/28/26**	**Mon 7/13/26**
Functional Acceptance Test (FATP)	**11 days**	**Thu 5/28/26**	**Thu 6/11/26**
Conduct Functional Acceptance Test	3 days	Fri 5/29/26	Tue 6/2/26
Monterey County to Witness Functional Acceptance Test	3 days	Fri 5/29/26	Tue 6/2/26
Functional Test Approved by Monterey County	0 days	Thu 6/11/26	Thu 6/11/26
Coverage System Acceptance Test	**19.5 days**	**Mon 6/1/26**	**Fri 6/26/26**
Test Equipment Installation and Dry run	**2.5 days**	**Mon 6/1/26**	**Wed 6/3/26**
Coverage Characterization Test Execution	**10.5 days**	**Thu 6/11/26**	**Fri 6/26/26**
Perform Talk-out BER/RSSI Test and Generate Test Report	2 days	Fri 6/12/26	Tue 6/16/26



Name	Duration	Start	Finish
Submit Coverage Characterization Test Report/Documentation to Monterey County/City of Greenfield	0.5 days	Fri 6/19/26	Fri 6/19/26
Coverage Characterization Test Presented to Monterey County/City of Greenfield	0 days	Fri 6/26/26	Fri 6/26/26
System Acceptance	**5 days**	**Fri 6/26/26**	**Mon 7/6/26**
Submit Letter of System Acceptance	1 day	Fri 6/26/26	Mon 6/29/26
Monterey County to Sign Letter of Acceptance of System	0 days	Mon 7/6/26	Mon 7/6/26
Warranty Starts	0 days	Mon 7/6/26	Mon 7/6/26
Final Acceptance	**34.5 days**	**Mon 7/6/26**	**Sun 8/23/26**
Program Documentation	**14 days**	**Mon 7/6/26**	**Fri 7/24/26**
Update "As-Built" Documentation Package with red-lines from the field	6 days	Mon 7/6/26	Tue 7/14/26
Prepare Final Drawing Package	7 days	Tue 7/14/26	Thu 7/23/26
Deliver Final As-Built Documentation Package to Monterey County	1 day	Thu 7/23/26	Fri 7/24/26
Warranty Hand off Meeting	**2.5 days**	**Mon 7/20/26**	**Wed 7/22/26**
Prepare for Warranty Handoff Meeting	2 days	Mon 7/20/26	Wed 7/22/26
Conduct Warranty Hand off meeting with Monterey County and After-Market Services Team	0.5 days	Wed 7/22/26	Wed 7/22/26
Final Acceptance Invoicing	**20.5 days**	**Fri 7/24/26**	**Sun 8/23/26**
Final Acceptance Billing Milestone	0 days	Fri 7/24/26	Fri 7/24/26
Final Acceptance	0 days	Sun 8/23/26	Sun 8/23/26



STANDARD WARRANTY

WARRANTY SUPPORT

L3Harris offers a standard one-year warranty on all proposed infrastructure equipment as outlined in the Standard Conditions of Sale.

Equipment

Warranty provides that the hardware and installation services furnished by L3Harris shall be free from defects in material and workmanship.

During the Warranty if any Hardware component or portion of the installation Services fails to meet the warranty, L3Harris will remedy by: (1) repairing any defective component of the Hardware, or (2) by furnishing any necessary repaired, refurbished, or replacement parts, or (3) by correcting the faulty installation.

L3Harris will perform, at its discretion, all warranty labor at a L3Harris location. Where L3Harris has determined it is not feasible to ship fixed equipment for repair, L3Harris will repair on premise. Standard warranty response times are standard business days, 8:00 a.m. to 5:00 p.m. Eastern. For additional levels of support, premium services are available.

Software

During the Warranty, if the L3Harris licensed software does not successfully operate, the error or defect will be corrected free of charge or make available a substitute program.

Warranty provides corrections to software defects and known errors reported to L3Harris' Technical Assistance Center (TAC) during the warranty period at no additional cost to the Customer. Installation of corrections to software defects reported to TAC during the warranty period is not included in the Warranty.

Third-Party Warranties

L3Harris will ensure that warranty on any third-party Original Equipment Manufacturer (OEM) equipment and services sold by L3Harris meets the same warranty requirements and we will act on behalf of the Customer to coordinate and settle all warranty issues with any integrated third-party equipment or software companies throughout the warranty period.

L3Harris will transfer third-party warranties provided directly from equipment manufacturers to the Customer as part of the final acceptance.

Warranty Returns Process

The following procedure describes the returns process for equipment under warranty:

1. L3Harris creates a support case number, verifies product part numbers, serial numbers, reasons for return and then forwards the approved request for processing.

2. L3Harris reviews the request and provides a return merchandise authorization number (RMA) to the County, along with instructions for return of the equipment.
3. The County ships the equipment back to L3Harris Depot Repair and Return.
4. L3Harris repairs or replaces any equipment free of charge unless there is evidence of abuse or damage beyond the terms of the service
5. L3Harris ships the repaired or replacement unit back to the County.
6. L3Harris closes the RMA and updates the tracking database.

Requests for repairs out of warranty will require a purchase order unless a service agreement exists. Any repairs out of warranty are subject to a flat rate, per-unit fee, regardless of fault found with the equipment. If the item for repair does not have a flat rate fee listed, a time and material charge will apply. The turn-around time for equipment repair or replacement is typically ten business days.

Depot Level Repair and Return

The Depot Repair and Return service covers the cost to fix covered equipment at L3Harris or other third-party manufacturer's factories. This service is part of our standard warranty and is a premium service during the maintenance periods. The L3Harris Depot Repair and Return facility is ISO 9001:2015, UL, and Factory Mutual certified. Master technicians using state-of-the-art test equipment verify that all repairs meet or exceed prescribed specifications.

The Depot Repair and Return Facility utilize a stockroom of common repair parts to reduce repair time. Our technicians can repair over 95% of radio and infrastructure equipment on-site, decreasing turn-around time. Customers are encouraged to call in advance regarding equipment returns to verify inventory and serviceability.

Demand Services

Demand services are available when an unexpected event or situation occurs outside the scope of work and requires repairs from L3Harris, its agents, or partners. For demand services, the County will receive an invoice on a time and materials basis. Examples may include the following:

- Installation, updating, upgrading, maintaining, or removing software, hardware, or non-L3Harris infrastructure after initial installation.
- Repair of equipment damaged by vandalism, abuse, neglect, or noncompliance to L3Harris recommended practices, to the extent such equipment damage is not caused by L3Harris or any of its agents.
- Damages due to acts of God or other uncontrollable events
- Any other repair or service not outlined in the Scope of Work

Exclusions

Standard exclusions apply as referenced in the following documents:

- Standard Conditions of Sale
- Equipment Warranty

L3HARRIS™

TEST PLAN FOR SYSTEM ACCEPTANCE

Customer:
Monterey County

Prepared by:
Vince Liguori

Table of Contents

TEST PLAN

INTRODUCTION

L3Harris designed this System Test Plan to validate the installation and functionality of our VIDA system at the SR11 release. It defines the plan for conducting tests and analyzing test results, to confirm that the system satisfies design objectives.

The Test Team shall perform these tests in the order they appear in the plan and test procedures, or as required by the L3Harris systems engineer. The team will record test results in the appropriate test procedure referenced by this document. The prescribed test procedures have been developed and rigorously vetted by L3Harris engineering to provide extensive functional verification of the system features under test.

ROLES AND RESPONSIBILITIES

A Test Team consisting of at least one L3Harris system engineer and one Monterey representative to act as a witness to the testing is required to execute the test plan. It may be necessary for a secondary team, consisting of an additional L3Harris employee and a Monterey witness, to be present at another location to test certain features, such as multisite calls or for the secondary team to initiate site alarms so that the primary team can observe them from a system management terminal (SMT).

An L3Harris employee will execute the test steps outlined in the test procedure using the required equipment and with optional assistance from Monterey representatives. Additional personnel may attend as desired, or as required, to provide access or escort others to certain locations, such as RF shelters or other restricted access areas. Monterey shall provide access for the entire team to its facilities, including, the Network Switching Center (NSC) locations, RF site shelters, and dispatch locations. For secure facilities, appropriate access permissions must be granted prior to the testing events.

ACCEPTANCE TESTING CLARIFICATION

Final acceptance testing can occur in two separate phases. The first phase of testing begins with functional testing performed in the L3Harris staging facility immediately after initial factory configuration is complete. During this first phase, Monterey representatives may be on-site to witness the testing. The second phase occurs after final installation at customer facilities.

Staging tests, as detailed in the identified test procedures, verify equipment functionality that we can reasonably perform in a factory environment. We will perform all identified functional testing in the field after final install and commissioning of the system.

Factory staging tests will be virtually conducted via a remote video conferencing session. The virtual testing allows for a greater number of participants than typically allowed for during an on-site visit.

Once acceptance testing begins, we will lock system configurations, hardware platforms, and software versions, except to correct software defects affecting system performance. Prior to conducting the factory tests, we perform a system audit to verify installation of the appropriate software system release version on each platform.

ELECTRICAL SPECIFICATIONS

If requested, L3Harris will provide raw test data and site alignment measurements from the factory Automated Manufacturing Test Station (AMTS) for the L3Harris provided transceiver equipment.

BASELINE CONFIGURATION

L3Harris systems include a baseline configuration with a predefined test agency and group structure to support the defined test procedures. L3Harris system engineering will determine the hardware and software revisions during program planning and check the system conforms to that baseline prior to the start of testing.

A complete set of as-built system schematics will be available during testing and includes:

- System block diagrams
- Network schematics
- Connection diagrams
- Wiring and cabling schematics
- Rack up drawings
- Alarm punch down drawings
- Grounding and power schematics

TESTING PREREQUISITES

Following installation and commissioning of the applicable hardware and software, L3Harris will verify the system readiness for test. If the testing includes RF sites, L3Harris will complete site alignment and optimization by setting site configurations, aligning stations, and optimizing system timing parameters. As part of the standard installation practices, we measure equipment settings and record levels. L3Harris will provide these site measurements as part of the final documentation package. These parameters include:

- Transmit frequency and deviation
- Output and reflected power
- Receiver sensitivity
- Receiver multicoupler gain (if applicable)
- Receiver preamplifier gain (if applicable)
- Time domain reflectometry of transmission line
- Combiner loss (if applicable)
- Audio line out
- Audio line in

Prior to conducting installation testing, L3Harris performs a system audit to verify installation of the appropriate system release version of software on each platform.

Finally, prior to conducting the testing procedures detailed in this document, L3Harris and Monterey representatives will agree upon the dates and times of the test.

Finally, prior to conducting the testing procedures detailed in this document, L3Harris and Monterey representatives will agree upon the dates and times of the test.

SYSTEMS AND SITES TO BE TESTED

L3Harris will test the SR11 system installed at each of Monterey locations. Functional testing is expected to take up to two to three days per site but may complete sooner.

Final system acceptance testing will take place at each of the RF site locations. A site will be chosen to initiate the testing, and all test procedures appropriate to the site will be executed and recorded. Once a site completes the test cycle, the team will move on to the next site. This approach will repeat until all sites complete testing.

Equipment is located at various locations across the facilities and is identified as the following:

SYSTEM/SITE LOCATION	ADDRESS OR BUILDING NUMBER	SYSTEM/EQUIPMENT DESCRIPTION
Dispatch Consoles	Primary Dispatch - ITD	
2 Simulcast Sites	1 Cell 1, 1 Cell 2	
1 Multisites	Los Lobos	

PASS/FAIL CRITERIA

Criteria for Pass / Fail is determined by execution of the test procedures in the Acceptance Test Plan. If a feature test is successfully executed, that feature is deemed to be compliant and results in a PASS. If a failure occurs, the failed test may be repeated to address missed steps or configuration requirements overlooked during execution.

If a certain piece of equipment is deemed to be malfunctioning and duplicate spare equipment is available to replace it, the test may be executed using the spare equipment. If the feature test is successfully executed on the spare equipment, the feature will be deemed compliant and result in a PASS. At such time as the original piece of equipment is repaired or replaced and is able to function as designed, the original equipment will be returned to service and tested to ensure functionality.

If a feature is found to be non-compliant, L3Harris will address the non-compliance and retest. Until a successful retest, the feature is deemed to be non-compliant and results in a FAIL.

If it is necessary to defer a test for any reason, it may be marked as Not Yet Evaluated (NYE). The test may be executed, with appropriate witnessing, at any time afterward to change the result to a PASS.

TROUBLE REPORTING

Any issues found during testing will first be recorded on the comment page at the end of the feature set, and then they will be reported directly to the L3Harris program manager to be logged in the project issues log for corrective action.

Failures must be appropriately addressed. For hardware failures occurring during test events, failed hardware will be removed from the system being tested and turned over to L3Harris' quality organization for repair or replacement. Failures must be appropriately addressed. For hardware failures occurring during test events, failed hardware will be removed from the system being tested and turned over to L3Harris' quality organization for repair or replacement.

Test Procedures

FEATURES TO BE TESTED

The following list of acceptance procedures will be used to validate system performance:

- Network Switching Centers
- 3 RF Sites
- 3.0 Symphony Dispatch Consoles

TOOLS / TEST EQUIPMENT

Unless otherwise specified, L3Harris will supply all special tools necessary to test the product.

Equipment list TBD during program planning.

EQUIPMENT MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

RADIO MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

Safety

L3Harris will take reasonable safety precautions to ensure personnel against harm while operating within and traversing the installations.
General safety guidelines for portable radios:

- Do not hold onto the antenna when the radio is powered on.
- To ensure you do not exceed FCC RF exposure compliance requirements, always keep the antenna at least 0.43 inches (1.1 cm) away from the body and 0.98 inches (2.5 cm) from the face when transmitting.
- Do not use the portable radio with a damaged or missing antenna. A minor burn may result if skin comes into contact with a damaged antenna. Replace a damaged antenna immediately. Operating a portable radio with the antenna missing could cause personal injury, damage the radio, and may violate FCC regulations.
- Use only manufacturer-approved antennas. Use of unauthorized antennas, modifications, or attachments could cause damage to the radio unit and may violate FCC regulations.
- RF energy from portable radios may affect some electronic equipment. Most modern electronic equipment in cars, hospitals, homes, etc., is shielded from RF energy. However, in areas in which you are instructed to turn off two-way radio equipment, always observe the rules. If in doubt, turn it off!

L3Harris engineering will identify environmental detriments prior to testing, if deemed applicable. L3Harris will make adjustments to the extent required to address any such deficiencies deemed to present a danger to either system performance or personnel safety; examples include excessive temperature variations, contaminants, hazardous materials, or obstructions to LMR equipment.

TEST PROCEDURES

SYSTEM FEATURE SET

P25 Trunked Calls and Site Features

MULTISITE GROUP CALL

Purpose: This test will demonstrate that the system will allow a group call to function in a multisite environment.

Expected Results: The test will demonstrate that all radios assigned to a common group will hear a call regardless of the site they are affiliated with.

Setup: Radios must be affiliated with sites with VNIC connectivity (wide area communications).

DESCRIPTION	RADIO LID	SITE AFF	TG DESCRIPTION	TG ID
Radio 1	9980001	Site 21	TG 64001 P25	64001
Radio 2	9980002	Site 21	TG 64001 P25	64001
Radio 3	9980003	Site 25	TG 64001 P25	64001

Execution:

1. PTT Radio 1 and talk.
2. The transmit (TX) indicators should turn on at Radio 1.
3. Radios 2 and 3 should hear the call.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

MULTISITE EMERGENCY GROUP CALL

Purpose: Demonstrate the capability of the system to process an emergency group call.

Expected Results: This test will verify that when a radio indicates an emergency group call, all other radios in the group indicate an emergency and the emergency can be cleared by an administrator radio.

Setup: Program three radios with the same emergency home group. Set the supervisor (Radio 1) & Radio 2 to the home group. Set Radio 3 to a different group (not home group). A console will be used to clear the emergency.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	2
Radio 3	9980003	TG 64003 P25	64003	1

Execution:

1. Press the Emergency call button on Radio 1 and talk within the pre-defined Emergency Auto-key time, and/or PTT Radio 1 during or just after that time.
2. Verify that Radio 1 indicates the “TX EMER” declaration and that it reverts to the home group.
3. Verify Radio 2 (on Site 2) indicates a “RX EMER” and hear audio on the emergency home group.
4. Verify Radio 3 does not display the emergency.
5. Clear the emergency with the console.
6. Verify the emergency clears in the radios.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

ROAMING / PROROAM (If Applicable)

Field Only Test

Purpose: This test will demonstrate the ability of radios to scan and find adjacent site control channels as a user travels (or roams) between LMR sites or simulcast cells.

Expected Results: As the signal quality degrades the radio will scan the adjacent control channels and log on to adjacent available control channel.

Setup: The two radios used for this test must be capable (feature encrypted) and programmed for ProRoam.

The radios must be valid on the two sites (Site 1 and Site 2) being used to conduct the tests. Site 1 and Site 2 should have overlapping coverage to verify priority system scan (if tested). Log Radio 1 and Radio 2 onto Site 1. Ensure the radios are communicating.

Verify that the tone suppress option is not selected in the personality so that an audible tone can be heard once the radios switch systems. Program both radios for dynamic scan mode.

To test Priority System Scan (a.k.a., Preferred Site), ensure only Radio 1 has one of the sites (Site 1) used for the test as its priority system. Have Radio 2's Priority System Scan site set to a site not near the sites used in this test (i.e., not Site 1 or Site 2).

Note that the display and indications of each model of radio differ. This test describes the general procedure for ProRoam roaming. Refer to the specific radio operator's manual or the ProRoam Release Notes for details.

Execution:

1. Start with both radios at Site 1.
2. Begin traveling toward an area where the coverage from Site 2 is stronger than the coverage from Site 1.
3. As you travel away from Site 1 and towards Site 2, the signal quality will deteriorate. Once the signal level of Site 2 exceeds the programmed ProRoam parameters in the personality.
4. Radio 1 and Radio 2 will switch to the Site 2.
5. The radios will generate audible tones and will visually indicate that they have switched to Site 2 cell.
6. After the radios have both switched to the Site 2 cell, verify communications continue.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Emergency

LOCAL FDMA EMERGENCY, MULTISITE (NON SINGLE-CELL SIMULCAST / MULTISITE ONLY)

Purpose: This test is set up to demonstrate the multisite FDMA emergency.

Expected Results: This test will verify that the system will not drop a channel to assign a channel an emergency in FMDA mode.

Setup: This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there is only two working talk paths on the site.

Description	Radio LID	TG Description	TG ID	Site
Radio 1	9980001	TG 64101 P25	64101	1
Radio 2	9980002	TG 64102 P25	64102	1
Radio 3	9980003	TG 64103 P25	64103	1
Radio 4	9980004	TG 64101 P25	64101	2
Radio 5	9980005	TG 64102 P25	64102	2
Radio 6	9980006	TG 64103 P25	64103	2

Execution:

1. Disable channels at Site 1 and Site 2 so the sites only have two working FDMA talk paths.
2. PTT Radio 1 and 2 to busy up the sites.
3. Declare an emergency on Radio 3.
4. Radio 3 Should enter the queue.
5. Un-key Radio 2.
6. Verify Radio 3 is assigned the call.
7. Un-key all radios and clear the emergency with the Radio 1.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

LOCAL TDMA EMERGENCY, MULTISITE

Purpose: This test is set up to demonstrate the multisite TDMA local emergency.

Expected Results: This test will verify that the system will drop a local channel to assign a channel an emergency in TDMA mode.

Setup: This test requires six radios and two working talk paths on the site. Disable channels (if necessary) until there are only two working talk paths on the site.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64151 P25	64151	1
Radio 2	9980002	TG 64152 P25	64152	1
Radio 3	9980003	TG 64153 P25	64153	1
Radio 4	9980004	TG 64151 P25	64151	2
Radio 5	9980005	TG 64152 P25	64152	2
Radio 6	9980006	TG 64153 P25	64153	2

Execution:

1. Disable channels at Site 1 and Site 2 so that only the sites have two working TDMA talk paths.
2. PTT Radio 1 and 2 to busy up the sites.
3. Declare an emergency on Radio 3.
4. Verify call is dropped to Radio 1 and tone is heard.
5. Verify Radio 3 is assigned a channel / one TDMA Slot.
6. Verify a console hears calls from Radio 2 and 3.
7. Un-key all Radios and clear the emergency with the Radio 1.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

NETWORK SWITCHING CENTER FEATURE SET

VIDA Unified Administration System (UAS)

ACTIVE DIRECTORY CONTROL OF UAS USER ACCOUNTS

Purpose: Transition from managing UAS-user accounts in the UAS application to AD instead. New systems will be shipped w/ AD control instead of UAS application user control. Existing systems may choose to switch to AD control or continue to use the existing accounts in UAS.

Expected Results: Demonstrate UAS Login; the UAS uses Active Directory-configured user login with AD username and password.

Setup: All users configured in Active Directory prior to UAS Login. UAS Users are added to AD 'Active Directory Users and Computers' > within vida.local area > VIDA Users > VIDA Administrators > "each User defined here". For "User X", within "Properties" > "Member of" Tab; User X needs appropriate "VIDA UAS access group".

Execution:

1. Login into UAS with AD user login. Use AD username and password.
   UAS web login interface will pass username and password to Active Directory for authentication.
2. Verify user has logged into the UAS.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

CREATE AN AGENCY LEVEL ADMINISTRATOR ACCOUNT IN THE UAS

Purpose: Demonstrate the capability to create agency admin accounts in the UAS.

Expected Results: Test will create a new agency level administrator account.

Setup: Need system level access to an UAS or UAS client. Predefined agency and region in the UAS.

Execution:

1. Browse to the UAS at the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log in with UAS administrator level account.
3. Verify that default accounts are created (see list below) and verify a default Agency administrative class, by selecting System/Administration/Admin User.
4. Select "Add" to display the Administration User Detail screen.
5. Enter a name (e.g., TestAgency), description, and password. Select save to download and click 'OK'.
6. Log out of the default account.
7. Log in with the new TestAgencyAdmin.
8. Verify access to account.
9. Log out of the Test AgencyAdmin.
10. Log in with the default account and delete the TestAgencyAdmin.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

PROVISION AGENCY WITH TALKGROUPS AND SUBSCRIBER UNITS IN THE UAS

Purpose: Demonstrate the capability to add talkgroups and users to the agency accounts in the UAS.

Expected Results: Test will show that a user can add a new TG and users to the system.

Setup: System/region/agency level access to the UAS or a UAS client.

Execution:

1. Log into the UAS with one of the default accounts.
2. Select Agency 998, select 'R/W Talkgroup', to create a talkgroup.
3. Click 'Add' and then on the 'Talkgroup Detail' screen input the talkgroup ID from the table below. For any setting not listed, use the auto setting. Click OK and download.
4. Verify the talkgroup has been added to the list of talkgroups.

TG ID	NAME	DESCRIPTION	SPNI	PROPERTY ID	PRIORITY ID	COVERAGE	VALID COVERAGE
64454	64454ANA	Half Rate Low Priority	1	3	5	P25Sites_PSAPs	P25Sites_PSAPs

5. Using telnet, log into a traffic controller at a control point for simulcast or site for multisite and issue the command 'show gdb'.
6. Verify that Group 64454 exists in the traffic controller user data base.
7. Once the group has been verified, delete it from the UAS.
8. In the UAS, select Voice End (VEU) User tab and add a VEU.
9. Select the Subscriber Unit tab, and add a Subscriber Unit for the Voice End User.
10. Using Telnet, log into a traffic controller at a control point for simulcast or site for multisite and issue the command 'show udb'.
11. Verify the added user exists in the traffic controller user data base.
12. Once the user has been verified, delete it from the UAS.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

DYNAMIC REGROUP FROM THE UAS

Purpose: Demonstrate ability to dynamically regroup subscriber units from the UAS.

Expected Results: Test will combine selected talkgroups into a single interop group.

Setup: Radios must have "Allow P25T Unsolicited Dynamic Regroup" checked in the radio personality under general options. Ensure radio IDs and talkgroup IDs are uploaded to the site.

DESCRIPTION	TG DESCRIPTION	TG ID	SITE
Radio A	TG 64001 P25	64001	1
Radio B	TG 64002 P25	64002	1
Radio C	TG 64003 P25	64003	1

Execution:

1. At the UAS, select 'Regroup' tab and 'Regroup Profile'.
2. Click 'Add' to add profile detail; name Group 'Regroup1', and Description 'Regroup1 Test'.
3. Define regroup profile; select Agency 998 and 'TG64003'.
4. Select 'OK' and save changes to the UAS.
5. Click 'End User Group' and click 'Add'. Name Group 'Regroup1' and Description 'Regroup1 test'.
6. Select Agency 998 from 'Select a Scope' drop down box.
7. Add 'Radio A' and 'Radio B' to the 'Selected' windows.
8. Select 'OK' to close 'End User Group Detail'.
9. Click 'Save' button to download the new regroup.
10. Click 'Define Regroup' and click 'Add' to name the regroup 'Regroup1' and description 'Regroup1 test'.
11. Change 'Profile Name' to 'Regroup1' and change 'End User Group Id' to 'Regroup1'.
12. Click 'OK' and save to click 'Save' the changes to the UAS.
13. Click 'Manage Regroup' check the box for 'Regroup1' and select the button for 'Regroup'.
14. Click 'Save' to start regroup.
15. Verify that Radio A and Radio B are forced to 'Talkgroup 64003'.
16. At 'Radio A' and 'Radio B', attempt to change talkgroups away from 'Talkgroup 64003'
17. Verify that both radios are forced to remain on 'Talkgroup 64003'.
18. PTT 'Radio A' on 'Talkgroup 64003'.
19. Verify that 'Radio C' hears audio on 'Talkgroup 64003' and can respond.
20. Clear the dynamic regroup from the UAS client.
21. Verify 'Radio A' and 'Radio B' are no longer forced to 'Talkgroup 64003' (i.e., they can select other predefined talkgroups).

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

UNIT DEREGISTRATION

Purpose: Demonstrate that a radio will automatically deregister when the radio is turned off.

Expected Results: Test will show that the radio is off and will not create traffic load demand.

Setup: Radio A is the only radio on 'TG A' for this test. All other radios should be on different talkgroups. UAS>System Properties>Protocol Timer>Radio Re-Registration Timer for P25 trunked sites must be lowered to a minimum value to test this feature. It is typically setup for 360 minutes. Set the timer for two minutes and note the "calculated" value of "VNIC Remove Demand Timer". The VNIC Remove Demand Timer value is the "wait time" to see the radio be "deregistered" by the system after losing connectivity. Restart the VNIC following the change. Be sure to set the timer back to 360 minutes following the test.

Execution:

1. Browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account. Choose 'System Map' and select 'Launch Application' button. Open 'Realtime' tab and click 'Mobiles.'
2. Verify Radio A LID is shown registered on the site.
3. PTT console and verify it communicates on the system to Radio A.
4. Return call from Radio A to the console.
5. Turn off Radio A and wait for expiration of the radio timeout period.
6. Refresh RNM mobiles screen periodically and verify Radio A is deregistered after VNIC *Remove Demand Timer* has passed.
7. PTT console, after the expiration of the timeout.
8. Verify no channel is assigned to site, since no demand exists at the sites.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

UAS SITE ADJACENCY CONFIGURATION (FIELD TEST)

Purpose: Demonstrate the capability to configure site adjacencies in the UAS.

Expected Results: Site adjacencies will be successfully configured and modified.

Setup: UAS is installed and functioning on system network.

Execution:

1. In the UAS go to System > System Properties > Site adjacency.
2. Select a site on the left-hand side to configure for adjacency information.
3. Use the left-hand side to add adjacencies for the site.
4. Confirm the adjacent sites are removed from the non-adjacent site list and display correctly on the right side.
5. Use the right-hand side to remove a site adjacency.
6. Confirm the removed adjacency disappears on the right side and is displayed as a non-adjacent site on the left side.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

UNIT ENABLE/DISABLE FROM THE UAS

Purpose: Demonstrate the ability to disable a lost/stolen radio from the UAS.

Expected Results: Test will disable and re-enable a designated radio.

Setup: Ensure radios can communicate together on same trunk group. Verify all sites are connected to the NSC and are online.

Note: If a radio is encrypted, unit disable will automatically delete the encryption key from the radio, as it is disabled. To restore unit functionality for an encrypted radio, the radio must have the encryption key re-installed.

DESCRIPTION	TG DESCRIPTION
Radio A	TG A
Radio B	TG A
Radio C	TG A

Execution:

1. PTT on Radio C and verify call is heard on other Radios.
2. From the UAS:
3. Click Radio C Enable/Disable.
4. Under the Unit Enable/Disable tab, enter the ID of Radio C to be modified.
5. Select the disable button and check the status.
6. Attempt to PTT Radio C and verify that it will not communicate with the other radios.
7. PTT Radio A and verify that Radio C cannot receive the call.
8. Enable the ID of Radio C.
9. Verify that the Enable/Disable screen indicates that the current state of the radio is enabled.
10. Confirm that the radios can communicate by placing call.

TEST RESULTS				
Tester:				
Date:				
Result:	☐	Pass	☐	Fail

CREATE A SUBSCRIBER UNIT REPORT FROM THE UAS

Purpose: Demonstrate the capability to create a report of subscriber units in the UAS database.

Expected Results: Test will create a subscriber unit report.

Setup: Agency level access to UAS or a UAS client.

Execution:

1. Browse to the UAS using Internet Explorer and the address of 'https://s0u1uas.vida.local:8443/nas'
2. Log into the UAS as an agency-level administrator.
3. Select System/Report/Voice End User.
4. Type '0210' into the 'User ID' and select apply.
5. Verify that the UAS displays the user info for user '0210'

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Network Management

REAL-TIME SITE MONITORING (RNM)

Purpose: Demonstrate the capability to monitor real-time call activity from the RNM.

Expected Results: This test will show active call traffic on specific talkgroups and caller IDs.

Setup: Administrator access to the RNM.

Radio A and Radio B operating on a site and NSC under test, both programmed with Group A.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log into the RNM.
2. Choose the 'System Map' and select the 'Launch Application' button.
3. Open the 'Real-time' tab and click 'Site Activity'.
4. Select the site and expand.
5. Check the box next to the channels and select it to add the channels to the target list. Select the 'OK' button to launch the application.
6. Place a group call from Radio A to Radio B on the site.
7. Verify the event viewer displays the talkgroup ID and caller ID.
8. Verify the state changes from free to talk.
9. Verify the trunk group alias displays the group number.
10. Place an emergency call from Radio A to Radio B on the site.
11. Verify the event viewer displays the emergency indication.
12. Verify the event viewer displays the talkgroup ID and caller ID.
13. Place an individual call from Radio A to Radio B on the site.
14. Verify the event viewer displays an individual call on the channel.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

REGIONAL NETWORK MANGER (RNM) MONITOR SYSTEM STATUS

Purpose: Demonstrate the capability to monitor system status from the RNM.

Expected Results: This test will show system level equipment icons.

Setup: Administrator access to the RNM.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log into the RNM.
2. Choose the system map and select the 'Launch Application' button. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.
3. Verify the infrastructure is presented.
4. Select an object and right click to select properties to view information related to the object.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

RF SYSTEM ALARMS INDICATIONS ARE REPORTED (RNM)

Purpose: Demonstrate the capability to monitor system faults and alarms at the RNM.

Expected Results: Site equipment will send alarms to the RNM.

Setup: Need access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down or reset. Note the time of the alarm condition for later tests. On the 'RNM Domain' screen, verify all map icons are either green or blue. On the fault browser screen, delete any prior alarms.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Select the 'Network' tab and expand the tree in the left-hand panel until a site is in the right-hand panel.
4. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.
5. Verify that the RNM Network Viewer indicates a site alarm for the affected device.
6. Review alarm details by doing a right mouse click on an 'Alarm Object'. Select the desired menu option.
7. Verify alarm is listed in the 'Fault Browser'.
8. Turn the device back ON.
9. Verify that the device alarm clears and displays green.
10. Repeat Steps 2 - 3 for all equipment listed in the below chart.
11. Substitute https://s0u2rnm.vida.local/nmc and repeat test Steps 1 - 4 for the second RNM.
12. Record the results below for each site.

Note: This form can be modified to reflect actual as-built alarms

SITE #		SITE NAME	
ALARM #	NAME	RESULTS (PASS/FAIL)	REMARKS
1	Traffic Controller		Press the reset button on the TC and watch for the alarm
2	Router		Remove cable from Gi0/0 (interface to SAS)
3	Switch		Remove a cable from a PLAN port
4	PA		Disable one of the site PAs

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

VIDA EDGE SITE ALARM INDICATIONS ARE REPORTED (RNM)

FIELD TEST ONLY

Purpose: Demonstrate the capability to monitor site faults and alarms at the RNM.

Expected Results: Site level equipment will indicate faults and alarms at the RNM. During factory testing the alarm will be simulated by changing the active state polarity. During field acceptance testing the jumper alarm contacts will be opened or closed to simulate an alarm. An actual alarm could be monitored if the contacts have been connected.

Setup: This test verifies that the site and shelter alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (Network Sentry) alarm unit.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.
4. Select a physical site to test alarm inputs.
5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm
6. Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the 'Fault Browser.'
7. Clear the alarm condition.
8. Observe that the alarm indication has cleared in both the 'Network Viewer' and the 'Fault Browser.'
9. Repeat for each alarm and for each site in the system.
10. Record the results below for each site.

Note: This form can be modified to reflect actual as-built alarms.

SITE #		SITE NAME	
ALARM #	NAME	RESULTS (PASS/FAIL)	REMARKS
1			
2			
3			
4			

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

ENTERPRISE NETWORK MANAGEMENT DISPLAY VERIFICATION (ENM)

Purpose: Demonstrate ENM monitoring capabilities.

Expected Results: Monitor various components of the LMR system.

Setup: The ENM product must be configured in Active Directory, in the "VIDA ENM Administrators" group. The user must log into the ENM with an administrator account.

Execution:

1. Open Internet Explorer and browse to https://s0u0enm.vida.local.
2. On the left side of the screen select the "Maps" heading and the "Maps Dashboard" sub-heading. From here, you can select the type of map you would like to view.
3. Verify that geographical maps display system and NSC information as configured.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

ENTERPRISE NETWORK MANAGER ALARM AND ALERT TEST (ENM)

Purpose: Demonstrate the capability to monitor system faults and alarms at the ENM.

Expected Results: ENM will detect in system status by displaying the appropriate alarm.

Setup: Need access to the system under test and the ENM. The alarm will need to be generated by equipment being powered-down or reset. The ENM product must be configured in Active Directory in the "VIDA ENM Administrators" group. The user must log into ENM with an administrator account.

Execution:

1. On a client computer, open Windows Internet Explorer and browse to https://s0u0enm.vida.local. Log in with the Active Directory account.
2. On the left side of the screen select "Maps" heading and "Maps Dashboard" sub-heading. Then select "System" map. At the "System" map, select the icon for the NSC that you will be working on.
3. Generate an alarm on a device (see chart below) by powering down or otherwise disabling the device.
4. The machine will take a few minutes to shut down.
5. Verify after a few minutes that the host will be highlighted red, and the icon in the "Status" column will turn red.
6. Turn the device back on.
7. Verify after a few minutes the icon in the "Status" column will turn green. (It may take some time for the red highlight to clear).
8. Repeat Steps 1 - 5 for all equipment listed in the below chart.

   Note: This form can be modified to reflect actual as-built alarms.

ALARM #	NAME	DESCRIPTION	RESULTS (PASS/FAIL)	REMARKS
NSC1				
1	NSS	Network Switching Service		
2	ADSA	Active Directory Server (A, B, C)		
3	UAS	Unified Administration System		
4	RSM/PRO	Regional Site Manager		
5	LAP (BeOn)	LMR Access Point		
6	RNM	Regional Network Manager		
7	KMF	Key Management Facility		
8	EPO	ePolicy Orchestrator		
9	SUMS	Security Update Management Service		

ALARM #	NAME	DESCRIPTION	RESULTS (PASS/FAIL)	REMARKS
10	BAK	Backup Server (Unitrends)		
11	SMT	System Management Terminal		
12	Console-Dispatch (CON)	Console		
13	XCD	Transcoder		
		NSC2		
1	NSS	Network Switching Service		
2	ADSA	Active Directory Server (A, B, C)		
3	LAP (BeOn)	LMR Access Point		
4	RNM	Regional Network Manager		
5	BAK	Backup Server (Unitrends)		
6	XCD	Transcoder		

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

ENTERPRISE NETWORK MANAGER MOM FUNCTIONALITY TEST (ENM)

Purpose: Demonstrate the capability to monitor manager of managers (MoM) system alerts from the RNM to the ENM.

Expected Results: This test will show that when the s0u1rnm is turned off the ENM will show faults.

Setup: Administrator access to the ENM. The ENM product must be configured in Active Directory in the "VIDA ENM Administrators" group. The user must log into the ENM with an administrator account.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u0enm.vida.local and log in with the Active Directory account.
2. To see the active devices, click on the check box icon at the upper right-hand side of the screen.
3. Go to the red 'Host Down' icon that is next to the check box icon.
4. Shutdown s0u1rnm
5. The machine will take a few minutes to shut down.
   > After a few minutes, the host will show up in the 'Host Down' page.
6. Select the 'Critical' icon and see that:
   > s0u1rnm is up and has an error.
7. Turn the s0u1rnm back on and:
   > Make sure the error cleared.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Cybersecurity Testing

ACTIVE DIRECTORY

Purpose: The purpose of this test is to view the GPO structure on an Active Directory server.

Expected Results: The GPO structure is valid.

Setup: None

Execution:

1. Remote desktop into an Active Directory server.
2. Open Active Directory 'Users/Groups'
3. Validate that the computer accounts are in the appropriate containers.
4. Verify VIDA administrator accounts exist.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

SUMS

Purpose: Demonstrate the SUMS server is communicating with the remote client.

Expected Results: Test will verify the SUMS server is communicating with the remote clients and that the remote clients are updated.

Setup: N/A

Execution:

1. Remote Desktop into the SUMS server ‘s0u1sum’.
2. Launch the ‘IBM Endpoint Manager Console’ and log into the console with the SUMS administrative user.
3. Expand ‘Sites’ ‘Custom Sites’ ‘VIDA’ and select ‘Subscribed Computers’
4. Verify that each computer is listed, in the “Subscribed Computers” window
5. Check to make sure that each computer has reported to the SUMS server within the last 30 minutes by checking the ‘Last Report Time’ column.
6. To check to make sure all the subscriber computers are updated by selecting the ‘Baseline’ in the left-hand window.
7. Make sure the ‘Baseline’ window is empty or all computers in the window are gray.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

EPOLICY ORCHESTRATOR

Purpose: This test verifies that ePolicy Orchestrator is communicating with its end devices and it will report actions taken by McAfee Antivirus on a remote computer.

Expected Results: ePolicy Orchestrator is accessible and displays valid reporting.

Setup: N/A

Execution:

1. Use Internet Explorer on a client PC to navigate to the McAfee E-Policy Orchestrator server located at “https:/s0u1epo.vida.local:8443”.
2. Log in using proper credentials
   > Use local account user “xAdministrator”.
3. Go to ‘System Tree.’
4. Expand VIDA groups.
   > Verify all servers are in their appropriate containers (corresponding to Active Directory).

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

INTRUSION DETECTION

Purpose: This test verifies that the Cisco FireSIGHT is communicating with its IDS sensors at remote sites across the network.

Expected Results: Cisco FireSIGHT is communicating with its IDS sensors.

Setup: N/A

Execution:

1. Use Internet Explorer on a client PC to navigate to the Cisco FireSIGHT server at "https://s0u1dfc.vida.local" or "https://10.128.0.135".
2. Log in using proper credentials.
3. Go to the Cisco FireSIGHT dashboard.
4. Click 'Operations.' Go to 'Sensors.'
   > Verify all sensors are visible.

   NOTE: There is only one Cisco FireSIGHT Server with two sensors (one at each NSC) reporting to it.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

UNITRENDS SYSTEM BACKUP

Purpose: This test verifies the Unitrends server has a schedule for performing backups of network computers and that it can display the backup status of those computers.

Expected Results: The test will verify the backup configuration.

Setup: N/A

Execution:

1. Use Internet Explorer on a client PC to navigate to the Unitrends backup servers:
2. s0u1bak.vida.local located at "https://10.128.0.145".
3. s0u2bak.vida.local located at "https://10.128.0.177".
4. Log in using root.
5. On the left panel click protect.
6. On the left look at file level and VMware backups.
7. Verify that devices are visible and configured for backups.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

SPLUNK

Purpose: Verify the search functionality of the Splunk server.

Expected Results: The Splunk server will accurately search its database.

Setup: None

Execution:

1. Log into the Splunk server.
2. Go to the System Status Dashboard and verify devices are reporting
3. Attempt to log into a network device using incorrect credentials. Verify Splunk server captures the login attempt.
4. From an SMT open internet explorer and navigate to the Splunk web interface: **s0u1log.vida.local:8000**
5. Login with VIDA domain credentials from an account with VIDA administrative privileges.
6. Click the search link at the top of the page if the search bar is not immediately available. For basic searching there are two ways to search for logs:
    a. Searching by fields - Log data is parsed by Splunk into fields that can be referenced and searched. Field references are case sensitive.
    b. Searching by string
    A string is a line of text or numbers which can be found in the body of the logs.
    String searches are not case sensitive
    Can be slower than field searches.
7. Use the host field to search for all logs related to the s0u1app server.
    a. In the search bar enter the following text: **`host="s0u1app"`**
    b. Change the time frame to **Last 60 minutes** to save time during the test
    c. Click the Green magnifying glass to begin searching
    d. Result should show all logs related to the host "s0u1app" in the last 60 mins
8. Search by all security related logs on s0u1app by using two additive fields:
    a. Type into the search field: **`host="s0u1app" AND LogName="security"`**
    b. Results show all logs with the two specified fields:

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Over the Air Rekeying (OTAR)(If Applicable)

GENERATING A SYSTEM UKEK

Purpose: Test is setup to verify the KMFs ability to create a UKEK.

Expected Results: KMF will create a UKEK.

Setup: Test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running.

Execution:

1. Log into the KMF with the administrator level Active Directory account.
2. Open the 'Network KMF Management'
3. Select UKEK tab
4. Change 'Save As' text field to '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek'
5. Generate UKEK file by selecting the 'Export UKEK' button
6. Select 'SLN Bindings' tab
7. Change 'Save As' text field to '\\fileshare\fileshare\kmf_files\SlnBindingsReport/xml'
8. Generate bindings by selecting 'Generate SLN Bindings Report'. This file will be used in a later test.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

UKEK A RADIO

Purpose: Test is setup to verify the KMFs ability to load UKEKs into a radio.

Expected Results: Radio should accept the UKEK file developed by the KMF.

Setup: Test requires a computer that is on the IP network and has 'Harris Key Manager' installed and running. Three radios programmed with a talkgroup using an AES encryption key. All radios should be feature-encrypted and enabled for OTAR operation. Two radios should have keys and one radio should not have keys. In test "Unit Enable/Disable from the UAS" the keys were removed from Radio 5.

Execution:

1. On a computer with 'Harris Key Manager' installed, save the file at '\\fileshare\fileshare\kmf_files\ProvisionFile.ukek' to the local computer.
2. Start 'Harris Key Manager' and connect the radio to the local computer.
3. Select 'Tools' -> 'Key Load Wizard' to open key load wizard
4. Select 'Next' -> Load a UKEK file into one or more devices" and open the UKEK file in Step 1 and select 'Next'
5. Once the UKEKs are loaded select 'Next'
6. Power on the radio and choose connection method USB or Serial.
7. Select 'Load' to load UKEK into the radio.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

WARM STARTING A RADIO FROM THE UAS KEY MANAGEMENT APPLICATION

Purpose: This will test the system's ability to push encryption keys to a radio and the radio to hear other radios on the encrypted talkgroup.

Expected Results: Radio will accept keys from the system and be able to communicate with other encrypted radios on an encrypted talkgroup.

Setup: Test requires three radios with a talkgroup using an AES encryption key. Radios and the talkgroup need to be in a test CryptoNet in the UAS Key Management application. Radios should be both feature-encrypted and enabled for OTAR operation. Two radios should have working encryption, and Radio 5 should have the UKEK load but no keys.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 5	9980005	TG 64001 P25	64001

Execution:

1. PTT all three radios
   > Radios 1 and 2 should communicate normally
   > Radios 1 and 2 should hear calls from Radio 5, but Radio 5 should not be able to hear calls from the encrypted radios
2. From the UAS, warm start Radio 5.
   > The UAS will report "Warm Starting".
3. After the operation is complete, refresh the UAS screen.
   > Verify the UAS reports "Warm Started Success" for Radio 5.
4. Again, PTT Radio 1 on the encrypted talkgroup and talk.
   > Radio 1's transmit (TX) indicator should turn on and be amber.
   > Verify that Radio 2 and 5 now decrypt the call's audio.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

REKEYING AND CHANGING OVER A CRYPTO NET FROM THE UAS

Purpose: Test will show that the system can change encryption keys to a new set of keys.

Expected Results: After this test is complete, the radio will be able to communicate with the new set of keys sent by the system

Setup: Test requires three radios programmed with a talkgroup using an AES encryption key. Radios and talkgroup need to be in a test crypto net in the UAS Key Management application. All radios should be feature-encrypted and enabled for OTAR. Radios should have been warm started previously. If a console and/or gateway bases (GWB) are present in the system, then these devices should be included in this test also. They need to be in the same test crypto net as the radios and be programmed with the test talkgroup. They should have been warm started previously.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 5	9980005	TG 64001 P25	64001

Execution:

1. Put Radios 1, 2, and 5 on the encrypted talkgroup.
   > Verify that all 3 Radios can transmit and receive on the encrypted talkgroup.
2. Leave Radios 1 and 2 powered on and power off Radio 5.
3. From the UAS, rekey the crypto net. The UAS will report “Rekeying” for the crypto net.
4. Select report icon for the crypto net.
   > Radios 1 and 2 should be shown as “Rekeyed.”
   > Any consoles and/or GWB’s should also be shown as “Rekeyed.”
   > Radio 5 should be shown as “Rekey Failed.”
5. From UAS, change over the crypto net. It should report “Changing Over” for the crypto net.
6. After the operation is complete, refresh the UAS screen. It should report “Changing Over Complete” for the crypto net
7. Turn on Radio 5. PTT Radio 1 on the encrypted talkgroup and talk. The transmit (TX) indicator should turn on and be amber at Radio 1.
   > Verify that Radio 2 but not 5 decrypt the call’s audio.
   > Verify that any consoles and/or gateway bases decrypt the call’s audio also.
8. PTT Radio 5 on the encrypted talkgroup and talk.
   > The transmit (TX) indicator should turn on and be amber at Radio 5.
   > Verify that Radios 1 and 2 decrypt the call’s audio.
   > Verify that any consoles and/or GWB’s decrypt the call’s audio.
9. From UAS, do an end user level rekey on Radio 5 for that crypto net.
   > The UAS will report “Rekeying” for Radio 5.
10. After the operation is complete, refresh the UAS screen. It should now show “Rekeyed” for Radio 5.
    > Select the report icon for the crypto net. Radios 1, 2, and 5 will be shown as “Rekeyed.”
    > From the UAS, do an end user change over on Radio 5 for the test crypto net. The UAS will report “Changing Over” for Radio 5.

11. Again, PTT Radio 1 on the encrypted talkgroup and talk.
    - > Verify that Radio 1's transmit (TX) indicator turns amber.
    - > Verify that Radio 2 and 5 decrypt the call's audio.
    - > Verify that any consoles and/or GWB's also decrypt the call's audio.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

ZEROIZING A RADIO FROM THE UAS KEY MANAGEMENT APPLICATION

Purpose: Test will verify system's ability to delete keys from a radio that was encrypted.

Expected Results: A radio that has keys and can communicate with other encrypted radios and will have the keys removed so the radio cannot communicate with other encrypted radios.

Setup: Three radios programmed with a talkgroup using an AES encryption key. Radios and the talkgroup need to be in a test crypto net in the UAS Key Management application. All radios should be feature-encrypted and enabled for OTAR. The radios should have been warm started previously.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 5	9980005	TG 64001 P25	64001

Execution:

1. Put Radios 1, 2, and 5 on the encrypted talkgroup.
   > Verify that all 3 radios can transmit and receive on the encrypted talkgroup.
2. From the UAS, zeroize Radio 5.
   > The UAS will report "Zeroizing" for Radio 5 with the date and time updating to reflect the date and time the operation was initiated.
   > After the operation is complete, refresh the UAS screen. Verify the UAS reports "Zeroized" for Radio 5.
3. PTT Radio 1 on the encrypted talkgroup and talk.
   > The transmit (TX) indicator should turn on and be amber at Radio 1.
   > Verify that Radio 2 decrypts the call's audio.
   > Radio 5 should hear garbled audio or muted audio.
   > Verify the receive indicator is amber on both radios and the ID of Radio 1 should be seen at both Radios 2 and 5.
   > Verify Radio 5 shows "No Key 0" when it is PTT'ed on the encrypted talkgroup.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

REKEY A RADIO FROM THE RADIO

Purpose: Test system's ability to send keys to a radio, when radio requests keys.

Expected Results: Take a radio that has keys and can't communicate with other encrypted radios and add keys to the radio, so it can communicate with the system.

Setup: Three radios programmed with a talkgroup using an AES encryption key. Radios and the talkgroups need to be in a test crypto net in UAS Key Management application. All radios should be feature-encrypted and enabled for OTAR. One of the radios should be the radio that was zeroized in the previous test.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
Radio 1	9980001	TG 64001 P25	64001
Radio 2	9980002	TG 64001 P25	64001
Radio 5	9980005	TG 64001 P25	64001

Execution:

1. Key Radio 1 on an encrypted talkgroup.
   > Radio 1 should display 'No key' Radio 2, and Radio 5 should not hear the call.
2. From the menu on Radio 1 select 'Rekey' to request new key for Radio 1.
   > Once the radio receives the encryption keys, key Radio 1 and verify Radios 2 and 5 hear the call.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

UKEK AND SYMPHONY

Purpose: Test is setup to test the KMF's ability to make UKEK files for Symphony.

Expected Results: Symphony should accept UKEK file developed by the KMF.

Setup: Test requires three radios programmed with a talkgroup using an AES encryption key. All radios should be feature-encrypted and enabled for OTAR operation.

Execution:

1. With an encrypted radio, make a call on an encrypted talkgroup,
   > Radio with encryption should hear the call.
   > Symphony Console will not hear the call, since it does not have keys.
2. To load UKEK Keys to the Symphony Console, close the Symphony Console application, and start the Manual Key Load application to load UKEK Keys.
3. In 'Manual Key Load' application, do a "Zeroize", to remove any potential unwanted keys.
4. In 'Manual Key Load' application, do a "Load UKEK". Enter the UKEK filename, the password (if a password is associated with the file), and the RSI.
   > [RSI for Symphony (User ID), is defined in UAS > Subscriber Unit (for Symphony); or defined in KMF > in NKMC (Network KMF Mgmt. Console) > End Users Tab > at Console User ID.]
5. Restart Symphony Console application. UKEK keys are now available.
   > Verify Symphony 'System History' shows "KMF Key Load Completed".
   > Verify on console group / unit modules, the "encryption" key is enabled, no longer grayed out.
6. With an encrypted radio, make a group call on an encrypted talkgroup.
   > The radio with encryption will play the call,
   > The console will now hear the TG A audio.
7. On the Symphony talkgroup, ensure the encryption key is set for locked. Initiate call on Symphony talkgroup, and the call should be heard on the encrypted radios.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

WARM STARTING A SYMPHONY FROM THE UAS KEY MANAGEMENT APPLICATION

Purpose: This will test the system's ability to push encryption keys to a console.

Expected Results: UAS will push keys to the console to allow for communication on an encrypted talkgroup.

Setup: Three radios programmed with a talkgroup using an AES encryption key. Radios and the talkgroup need to be in a test crypto net in UAS Key Management. All radios should be feature-encrypted and enabled for OTAR. Radios should have their UKEK's loaded but not have any traffic encryption keys. (delete keys if required).

Execution:

1. Attempt to switch a talkgroup to encrypted mode by selecting the talkgroup and selecting the private button.
   > Verify that the console will not allow you to encrypt the talkgroup because the console does not have the encryption keys.
2. From the UAS, warm start the console. After the operation is complete, refresh the UAS screen.
   > The UAS will report "warm started success" on the console.
3. Attempt to switch a talkgroup to encrypted mode by selecting the talkgroup and selecting the private button.
   > The console will now allow you to encrypt the talkgroup because the console has the encryption keys.
4. PTT the console and the encrypted radios should hear the call.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Activity Warehouse

SITE ACTIVITY USING THE ACTIVITY WAREHOUSE

Purpose: Demonstrate the capability to create various agency level system usage reports.

Expected Results: Test will create an agency level user report.

Setup: Ensure radio traffic has occurred across the network recently. If necessary or desired, place some calls with a known radio ID on multisite talkgroups prior to running the test for reference during the test.

Execution:

1. Open a web browser and browse to 'https://s0u1pro.vida.local/reports' and log in with active directory credentials.
2. Select 'Activity Reports' → Call Activity
3. Enter the time period for the report (Example: 2-hour window before this test).
4. Enter additional report information required.
5. Click on "View Report"
   > Check to make sure that there is call activity.

   NOTE: These reports can be up to two hours behind.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

BeOn Features(If Applicable)

Purpose: Demonstrate the BeOn features.

Expected Results: Following tests will demonstrate that BeOn works as designed.

Setup: Tests will show that the BeOn system allows a smartphone to communicate with the radio system.

TRANSMIT GRANT TONE

Purpose: Demonstrate the grant tone on BeOn.

Expected Results: When the smartphone PTTs on the BeOn app, it will play a grant tone.

Setup: Grant tone (Ready to Talk tone) enabled in smartphone radio personality.

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG A
BeOn Phone 3	TG A

Execution:

1. Press PTT button on smartphone with valid group selected.
   > Verify grant tone is heard at smartphone when working channel access is granted.
   Note: If the call is queued, the grant tone will be delayed until the call is assigned a working channel.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

GROUP CALL

Purpose: Confirms BeOn can make group calls.

Expected Results: Selected talkgroup call audio is heard.

Setup: Set Smartphones 1, 2, and 3 to (Group A) per test group structure. Make sure Scan is turned OFF.

DESCRIPTION	TG DESCRIPTION
BeOn Phone 1	TG A
BeOn Phone 2	TG A
BeOn Phone 3	TG A

Execution:

1. PTT on BeOn Phone 1 and talk.
   - > The transmit (TX) indicators should turn on at BeOn Phone 1.
   - > Audio should be heard in BeOn Phone 2 and BeOn Phone 3.
   - > The ID of BeOn Phone 1 should be seen at BeOn Phone 2 and BeOn Phone 3.
2. Set BeOn Phone 3 to TG B. PTT on BeOn Phone 1 and talk.
   - > The transmit (TX) indicators should turn on at BeOn Phone 1.
   - > Audio should be heard in BeOn Phone 2 only.
   - > The ID of BeOn Phone 1 should be seen at BeOn Phone 2 only.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

INDIVIDUAL (PRIVATE) CALL

Purpose: Confirms individual calls can be initiated using BeOn enabled smartphones.

Expected Results: Individual calls are confirmed.

Setup:

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
BeOn_202	9980202	TG 64151 P25	64151
BeOn_203	9980203	TG 64151 P25	64151
BeOn_204	9980204	TG 64151 P25	64151

Execution:

1. Using the BeOn_202, select the pre-stored ID of BeOn_203 or enter the BeOn_203 ID directly from the keypad, and PTT Smartphone 1.
   > Verify that BeOn_203 receives the call and displays the ID of Smartphone 1.
   > Verify that BeOn_204 remains idle.
2. Release the PTT on BeOn_202 and immediately PTT on BeOn_203.
   > Verify that BeOn_202 receives the call and displays the ID of BeOn_203.
   > Verify BeOn_204 remains idle.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Trunked Logging Recorder

GROUP CALL

Purpose: Confirms group call audio is captured, recorded, and accessible on the logging recorder

Expected Results: Calls are captured, recorded, and accessible.

Setup:

DESCRIPTION	TG DESCRIPTION
Radio A	TG A
Radio B	TG A

Execution:

1. PTT Radio A and talk.
   > Audio should be heard on Radio B. Note the start time of the call and the approximate duration.
2. Retrieve the call from the logging recorder.
   > Verify the caller, callee, start time, and duration.
   > The caller should be the LID for Radio A and the callee should be the GID for TG A. Verification should include the user ID (LID), group ID (GID), and its alias as defined by the UAS.
   > Verify that the call is identified as a group call.
3. Playback the audio.
   > Confirm that the playback audio is all recorded and intelligible.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

High Availability NSS Switchover

HIGH AVAILABILITY WIDE AREA ROUTER FAILURE

Purpose: Demonstrate capabilities of the system to work after a WAR failure.
Expected Results: System components that are set-up with high availability will continue to work after a WAR failure.
Setup: These tests are setup to be run twice, once on each router. After completing Step 4 restart the WAR router if not already running. Wait 20 minutes and rerun the tests for the second router. These tests will simulate a WAR failure by disconnecting it from the Wide Area Network (WAN), so the WAR to WAN connection will need to be known.

DESCRIPTION	TG DESCRIPTION	SITE
Radio A	TG A	1
Radio B	TG A	1
Radio C	TG A	1
Radio D	TG A	2

Execution:

1. Use Radio A to initiate a call
   > Verify that the call is heard on the Radio B. Keep the call active during fail-over.
2. Use Radio C to initiate a call
   > Verify that the call is heard on Radio D. Keep the call active during fail-over.
3. Log in to s0u1nss and s0u2nss; change your user to the Root User and enter the password.
4. Type ‘HArunning’ into both NSSs, one will report that it is the ‘Stand By’ and one will report that it is the ‘Primary’. Note the name of the primary NSS and the primary WAR.

DESCRIPTION	TEST RUN 1	TEST RUN 2
Primary NSS Name		
Primary RNM Name		
Primary RNM Name		
Primary RSM Name		
Time of Server Reboot		

5. Log into the WAR that is associated with the ‘Primary’ NSS. “Reload” the WAR router.
   > The call from Radio C to Radio D will be dropped.
   > The call from Radio A to Radio B will continue and the console will lose connectivity to the VNIC.
   > Verify that after a short delay, the backup server NSS2 automatically takes over as the primary server.
6. Wait 20 minutes for the two NSS servers to synchronize and replicate their databases.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

VIDA NSS Failure

UNIT 1 NSS SWITCHOVER

Purpose: Confirm when the primary NSS losses power, it will fail over to the second NSS. The secondary NSS will take over the function of the primary NSS and restart multi-site (console) call traffic.

Expected Results: Test will simulate NSS failure of the active NSS and show the redundant NSS will restart call handing functionality. The calls between the radios (1 and 2) on the same site will operate normally during the failover, the call between radios (3 and 4) on different sites will drop for about 40 seconds. During the failover, the console will lose connectivity to the system for about 40 seconds.

Setup: To start this test, the VNIC needs to be on s0u1nss; if it is not, start with Unit 2 NSS Switchover Test and perform this test after that test. Open a terminal screen. For single site simulcast system only, ignore Radios 1 and 2.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	1
Radio 3	9980003	TG 64002 P25	64002	1
Radio 4	9980004	TG 64002 P25	64002	2
Console	9989101	TG 64001 P25	64001	
Console	9989101	TG 64002 P25	64002	

Execution:

1. Log into both NSS's.
2. Open a terminal window and login as a 'Super User'.
3. Type 'HArunning' in to both terminal windows. The server that displays 'Running as Primary' is the primary.
4. Start calls with Radio 1 and Radio 3, listen to the calls with Radio 2, Radio 4, and the console.
5. Create an NSS failure, on the primary Network Switching Server (NSS), by initiating a "HArestart" command in the NSS window.
   - > Primary NSS gives an alert message and goes down.
   - > The call from Radio 1 to Radio 2 will continue and the console will lose connectivity to the VNIC. The call from Radio 3 to Radio 4 will be dropped.
   - > Verify that after a short delay, the backup server NSS2 automatically takes over as the primary server.
6. On the RNM, verify:
   - > NSS1, MDIS, and VNIC icons turn red.
   - > NSS2, MDIS, and VNIC icons turn green.
   - > RNM reports NSS1, MDIS, and VNIC failure messages.
   - > Verify the call between Radio 1 and Radio 2 continues to be heard on Radio 2, then drop the test call.
   - > After failover, verify that multi-site group and individual radio calls can be made between Radio 3 and Radio 4.

- Verify NSS in Step 5 comes back into standby operation.
- Verify NSS1 Icon turns blue on RNM.

7. Wait 20 minutes for the two NSS servers to synchronize and replicate their databases.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

UNIT 2 NSS SWITCHOVER

Purpose: Confirm when the secondary NSS loses power, it will fail over to the primary NSS. The primary NSS with take over the function of the secondary NSS and restart multi-site call (console) traffic.

Expected Results: Test will simulate NSS failure and show the redundant NSS will restart call handing functionality. The calls between the radios (1 and 2) on the same site will operate normally during the failover, the call between radios (3 and 4) on different sites will drop for about 40 seconds. During the failover, the console will lose connectivity to the system for about 40 seconds.

Setup: To start this test, the VNIC needs to be on s0u2nss; if it is not, start with Unit1 NSS switchover test and perform this test after that test. Open a terminal screen. For single site simulcast system only, ignore Radios 1 and 2.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	1
Radio 3	9980003	TG 64002 P25	64002	1
Radio 4	9980004	TG 64002 P25	64002	2
Console	9989101	TG 64001 P25	64001	
Console	9989101	TG 64002 P25	64002	

Execution:

1. Log into both NSSs.
2. Open a terminal window and login as a ‘Super User’.
3. Type ‘HArunning’ in to both terminal windows. The server that displays ‘Running as Primary’ is the primary.
4. Start calls with Radio 1 and Radio 3, listen to the calls with Radio 2, Radio 4, and the console.
5. Create an NSS failure, on the primary NSS, by initiating a “HArestart” command in the NSS window.
   - > Primary NSS gives an alert message and goes down.
   - > The call from Radio 1 to Radio 2 will continue and the console will lose connectivity to the VNIC. The call from Radio 3 to Radio 4 will be dropped.
   - > Verify that after a short delay, the backup server NSS2 automatically takes over as the primary server.
6. On RNM, verify:
   - > NSS1, MDIS, and VNIC icons turn red.
   - > NSS2, MDIS, and VNIC icons turn green.
   - > RNM reports NSS1, MDIS, and VNIC failure messages.
   - > Verify call between Radio 1 and Radio 2 continues to be heard on Radio 2, then drop the test call.
   - > After failover, verify that multi-site group and individual radio calls can be made between Radio 3 and Radio 4.
   - > Verify NSS in Step 5 comes back into standby operation.
   - > Verify NSS1 Icon turns blue on RNM.
7. Wait 20 minutes for the two NSS servers to synchronize and replicate their databases.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

VIDA Inter-Operability Gateway Test

LOCAL INTEROPERABILITY (If Applicable)

Purpose: The purpose of this test is to verify correct functionality of the Interoperability Gateway.

Expected Results: Verify that the Interoperability Gateway connects via four-wire audio connections in its Universal Access Cards (UAC) cards to interoperability radio units (mobile or desktop). The gateway also connects to a router and the Network Switching Center (NSC) to provide call functionality across the network.

Setup: N/A

Execution:

1. Select 'Inter-op Group 1' on the radio.
2. Initiate a call from the radio to Group 1
   > Verify that audio is heard on inter-op Group 1 radio.
3. Initiate a call from the inter-op Group 1 radio to Group 1
   > Verify that audio is heard on the radio.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

NSC Test Notes / Issues

NSC Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

SYMPHONY CONSOLE FEATURE SET

TRANSMITTING WITH A MICROPHONE

Purpose: Demonstrate Symphony operator can initiate communication with a radio using Symphony select functions and foot pedal.

Expected Results: Confirms Symphony communication with radio

Setup: Radio set to same TG as console

Execution:

1. Press INSTANT TX function (right mouse button) on module with test group.
   - > Verify call is heard on radio.
   - > Verify a ripple effect on 'TX' indicator is displayed.
   - > Verify a channel access tone is heard.
   - > Release the Instant TX key.
2. Click the 'Select' button on the module to make the TG the selected talkgroup.
   - > Verify module for TG is highlighted, indicating it is selected talkgroup.
3. Make a call on TG by pressing PTT foot pedal.
   - > Verify a channel access tone is heard.
   - > Verify halo around the 'TX' indicator is displayed.
   - > Verify call is heard on radio.
   - > Verify audio is heard at radio on talkgroup.
   - > Release foot pedal to end call.
4. Make a call on TG by pressing headset button.
   - > Verify a channel access tone is heard.
   - > Verify halo around 'TX' indicator is displayed.
   - > Verify call is heard on radio.
   - > Verify audio is heard at radio on talkgroup.
   - > Release headset button to end call.
5. Make a call on TG by selecting it with a mouse.
   - > Verify a channel access tone is heard.
   - > Verify halo around 'TX' indicator is displayed.
   - > Verify call is heard on radio.
   - > Verify audio is heard at radio on talkgroup.
   - > Release mouse button to end call.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

RECEIVING CALLS (UNIT ID DISPLAY, TALKGROUP ID DISPLAY, ALIASING)

Purpose: Confirm Symphony operator can receive communications from a radio, using both TG A and individual calling.

Expected Results: Communications are initiated and received on appropriate speaker (select or unselect) and radio's ID is displayed.

Setup: Symphony has talkgroups A, B, and C configured with TG B selected.

Talkgroup Call

Execution:

1. Key radio and verify
   - That call is heard at unselect speaker.
   - Calling radio ID is displayed on module for TG.
   - A green light ID displayed indicating an incoming call on module TG A.
2. Switch radios talkgroup to TG B and key radio.
   - Verify call is heard at select speaker.
   - Verify calling radio ID is displayed on TG B module.
   - Verify a green light ID displayed indicating an incoming call on module for TG B.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

EMERGENCY CALL AND EMERGENCY ALARM

Purpose: Confirms Symphony indicates an emergency declared by a radio and can reset and clear emergency.

Expected Results: Symphony indicates and can clear emergency.

Setup: Test requires a test radio capable of generating and clearing an emergency (i.e. supervisor radio).

DESCRIPTION	TG DESCRIPTION
Radio A	TG A

Execution:

1. Using test radio, declare an emergency on TG A.
   - > Verify TG A module turns red,
   - > Verify ID/name of test radio is displayed
   - > Verify emergency alert tone is heard on Symphony.
2. Select triangle with a '!' to access emergency menu.
   - > Verify acknowledge 'Ack' button is red and check box is red.
3. Using radio, transmit on talkgroup
   - > Verify call is received by Symphony.
4. With Symphony, transmit on group with emergency.
   - > Verify test radio receives call and is still in emergency mode.
5. Acknowledge emergency by selecting 'Ack' button
   - > Verify button changes from 'Ack' to clear.
   - > Verify radio and Symphony are still in emergency mode.
6. Clear the emergency by selecting 'Clear X' button
   - > Verify Symphony clears emergency.
   - > Verify radio clears emergency.
7. Transmit on radio.
   - > Verify emergency is cleared and normal group calls have resumed.
8. Select TG A group selected on Symphony, declare an emergency on test group by pressing 'Emer Declare'.
   - > Verify Symphony and radio have same indications as Steps 2 to 4.
9. Acknowledge by hitting 'Ack' in Step 5.
10. Clear emergency with Symphony.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

GROUP EMERGENCY AND UNIT ALERT WITH SYMPHONY

Purpose: Confirm Symphony receives a group emergency and an emergency unit alert declared by a radio. Confirm console can acknowledge and clear emergency alarm (unit alert) and acknowledge and clear group emergency.

Expected Results: Symphony Console can indicate emergency alarm (unit alert) and group emergency. Symphony can also clear unit alert & cancel group emergency.

Setup: Radios 1 & 2 have "Emergency Alarm" enabled in personalities.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID
Radio 1	9980001	TG 64152 P25	64152
Radio 2	9980002	TG 64152 P25	64152

Execution:

1. Select TDMA TG 64152 on the console. On Radio 1, declare an emergency on TG 64152. PTT Radio 1 to talk to the dispatcher.
   > Verify Radio 2 on Site 2 receives emergency, and hears emergency group call.
2. On Symphony's TG 64152 Module:
   > Verify TG 64152 Module has a stripped red background.
   > Verify TG Smart Button flashes an "emergency icon", which alternates with TG icon.
   > Verify Declarer ID is shown in Red on TG Module.
   > Verify emergency alarm tone and radio emergency group call audio is heard on Symphony.
3. On Symphony's Sidebar Panel, go to the Emergency Panel:
   > Verify emergency listed shows TG 64152, in a mini module, with a red background.
   > Verify Declarer ID is listed, with an "ACK" button and a number '1', for number of group emergencies declared, [listed below TG Mini Module].
   > Verify below Declarer ID, single unit icon and Declarer ID is listed, with an "ACK" button.
4. To clear group emergency alarm tone on Symphony Emergency Sidebar Panel, select top "ACK" button next to Declarer ID.
   > Verify group emergency alarm tone is silenced on the console.
   > Verify group emergency is still displayed on talk group module and emergency sidebar panel.
   > Verify Unit Alert "ACK" is still displayed below group emergency.
5. On Symphony, select and transmit on TG 64152.
   > Verify Radio 1 and 2 both receive emergency call.

6. Clear group emergency on Radio 1.
   - > Verify console TG Module no longer indicates a group emergency.
   - > Verify the group emergency is no longer seen on Radio 1 and Radio 2.
7. PTT on Radio 1, to do a group call:
   - > Verify an emergency group call goes to the Symphony on TG64152 Module, and to Radio 2.
   - > Verify emergency is also seen in Emergency Sidebar Panel.
   - > (This occurs, since Emergency Unit Alert is still active on TG 64152.)
8. On Symphony Emergency Sidebar Panel, clear Unit Alert Tone by selecting second “ACK” button next to Unit Icon and Declarer ID. Also, clear Group Emergency Alarm tone on TG 64152, by selecting first “ACK” button next to Declarer ID.
   - > Verify all emergency tones have been silenced.
9. On Emergency Sidebar Panel, clear group emergency by selecting first “Clear” button next to Declarer ID. Also, clear Unit Alert by selecting second “Clear” button next to Unit Icon and Declarer ID.
   - > Verify emergency on TG 64152 has been cleared from Symphony, Radio 1, and Radio 2.
10. PTT on Radio 1 on TG 64152, to do a Group Call.
    - > Verify a group call without an emergency is seen and heard at Symphony and Radio 2.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Symphony Console Test Notes / Issues

Symphony Console Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

APPENDIX A – ACRONYMS AND DEFINITIONS

ACRONYM	DEFINITION
AD	Active Directory
AES	Advanced Encryption Standard
ATP	Acceptance Test Procedure
CAI	Common Air Interface (usually in reference to P25)
CME	Cisco Mobility Exchange (Telco Interconnect)
CNM	Central Network Manager, a L3Harris product
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
COTS	Commercial-off-the-Shelf
CPC	Channel Performance Criterion
DAQ	Delivered Audio Quality
DES	Digital Encryption Standard
LMR	Enterprise Land Mobile Radio
ESN	Electronic Serial Number (64 bits)
FDMA	Frequency Division Multiple Access
GID	Group ID (16 bit). This corresponds to a talkgroup. The group ID is unique within a VNIC and can be reused on other VNICs within the same WACN. Some of the older P25 documents refer to the GID as a talkgroup ID (TGID)
HA	High Availability
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
KEK	Key Encryption Key
KID	16-bit encryption key ID
KMF	Key Management Facility
KMM	Key Management Message
LAN	Local Area Network
MASTR V	An L3Harris base station product
MES	Mobile End System, a subscriber radio
MME	Miniature mobility exchange, which consists of L3Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)

ACRONYM	DEFINITION
N(S)	A 3-bit sequence number for the packet data unit
NSC	Network Switching Center
NSS	Network Switching Server
NWS	Network Sentry
OTAP	Over-the-air-programming
OTAR	Over-the-air-rekeying
P25	Project 25, a suite of standards for digital radio communications, developed by the Association of Public Safety Communications Officials (APCO) under the TIA TR-8 engineering committee, and published as the TIA-102 set of documents
Priority Talkgroup	The priority talkgroup selected on the subscriber device. Usually this is the talkgroup that the radio will transmit on when the user presses PTT
ProFile	An L3Harris product used for configuring radios over the P25 radio channel
ProScan	An L3Harris software algorithm used for radio roaming
PTT	Push-to-Talk
RAR	Regional Access Router
RF	Radio Frequency
RNM	Regional Network Manager
RSM	Regional Site Manager, a server that runs the RSM, Activity Warehouse and Device Manager applications
RSSI	Received Signal Strength Indicator
RVM	Regional VIDA Manager, a server that runs the UAS and RNM applications
SAN	Storage area network
SMT	System management terminal.
SU	Subscriber unit. In the P25 world, an SU is a mobile or portable radio
SUT	System Under Test
SUMS	Security Update Management Service (an L3Harris product)
SUMSplus	Version of SUMS
TAC	Technical Assistance Center, an L3Harris service
TDMA	Time Division Multiple Access
TEK	Traffic Encryption Key
TGID	Talkgroup ID (16 bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity that resides in a base station at the site and generates the P25 control channel
Tx	Transmit
UAC	Unified Audio Card

ACRONYM	DEFINITION
UAS	Unified Administration System
UKEK	User Key Encryption Key
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VIDA	Voice, Interoperability, Data, Access (an L3Harris system product)
VLAN	Virtual Local Area Network
VM	Virtual Machine
VNIC	Voice Network Interface Controller, the L3Harris voice switch
VPN	Virtual Private Network
VTI	VIDA Telephone Interconnect
WACN	Wide area communication network (20 bit network ID, part of SUID). This is a customer network that can include many VNICs
WAR	Wide Area Router
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

L3HARRIS™

TEST PLAN FOR SYSTEM ACCEPTANCE

Customer:

City Of Greenfied, Monterey County, CA.

Prepared by:

Vincent Liguori

Table of Contents

TEST PLAN

INTRODUCTION

L3Harris designed this System Test Plan to validate the installation and functionality of our P25 Single Multisite system at the SR11.1 release. It defines the plan for conducting tests and analyzing test results, to confirm that the system satisfies design objectives.

The Test Team shall perform these tests in the order they appear in the plan and test procedures, or as required by the L3Harris systems engineer. The team will record test results in the appropriate test procedure referenced by this document. The prescribed test procedures have been developed and rigorously vetted by L3Harris engineering to provide extensive functional verification of the system features under test.

ROLES AND RESPONSIBILITIES

A Test Team consisting of at least one L3Harris (L3H) system engineer and one city of Greenfield representative to act as a witness to the testing is required to execute the test plan. It may be necessary for a secondary team, consisting of an additional L3Harris employee and a city of Greenfield witness, to be present at another location to test certain features, such as multi Site calls or for the secondary team to initiate site alarms so that the primary team can observe them from a system management terminal (SMT).

An L3Harris employee will execute the test steps outlined in the test procedure using the required equipment and with optional assistance from a Greenfield representatives. Additional personnel may attend as desired, or as required, to provide access or escort others to certain locations, such as RF shelters or other restricted access areas. City of Greenfield shall provide access for the entire team to its facilities, as needed including, the Network Switching Center (NSC) locations, RF site shelters, and dispatch locations. For secure facilities, appropriate access permissions must be granted prior to the testing events.

ACCEPTANCE TESTING CLARIFICATION

Final acceptance testing can occur in two separate phases. The first phase of testing begins with functional testing performed in the L3Harris staging facility immediately after initial factory configuration is complete. During this first phase, greenfield representatives may be on-site to witness the testing. The second phase occurs after final installation at customer facilities.

Staging tests, as detailed in the identified test procedures, verify equipment functionality that we can reasonably perform in a factory environment. We will perform all identified functional testing in the field after final install and commissioning of the system.

Factory staging tests will be virtually conducted via a remote video conferencing session. The virtual testing allows for a greater number of participants than typically allowed for during an on-site visit.

Once acceptance testing begins, we will lock system configurations, hardware platforms, and software versions, except to correct software defects affecting system performance. Prior to conducting the factory tests, we perform a system audit to verify installation of the appropriate software system release version on each platform.

ELECTRICAL SPECIFICATIONS

If requested, L3Harris will provide raw test data and site alignment measurements from the factory Automated Manufacturing Test Station (AMTS) for the L3Harris provided transceiver equipment.

BASELINE CONFIGURATION

L3Harris systems include a baseline configuration with a predefined test agency and group structure to support the defined test procedures. L3Harris system engineering will determine the hardware and software revisions during program planning and check the system conforms to that baseline prior to the start of testing.

A complete set of as-built system schematics will be available during testing and includes:

- System block diagrams
- Network schematics
- Connection diagrams
- Wiring and cabling schematics
- Rack up drawings
- Alarm punch down drawings
- Grounding and power schematics

TESTING PREREQUISITES

Following installation and commissioning of the applicable hardware and software, L3Harris will verify the system readiness for test. If the testing includes RF sites, L3Harris will complete site alignment and optimization by setting site configurations, aligning stations, and optimizing system timing parameters. As part of the standard installation practices, we measure equipment settings and record levels. L3Harris will provide these site measurements as part of the final documentation package. These parameters include:

- Transmit frequency and deviation
- Output and reflected power
- Receiver sensitivity
- Receiver multicoupler gain (if applicable)
- Receiver preamplifier gain (if applicable)
- Time domain reflectometry of transmission line
- Combiner loss (if applicable)
- Audio line out
- Audio line in

Prior to conducting installation testing, L3Harris performs a system audit to verify installation of the appropriate system release version of software on each platform.

Finally, prior to conducting the testing procedures detailed in this document, L3Harris and CoG representatives will agree upon the dates and times of the test.

Finally, prior to conducting the testing procedures detailed in this document, L3Harris and City of Greenfield representatives will agree upon the dates and times of the test.

SYSTEMS AND SITES TO BE TESTED

L3Harris will test the P25, P2 Multi-Site system installed at the Greenfield Water Tank (WT) location. Functional testing is expected to take up to two to three but may complete sooner.

Final system acceptance testing will take place at the Greenfield WT RF site location. The site will be chosen to initiate the testing, and all test procedures appropriate to the site will be executed and recorded. Once the site completes the test cycle, the team will move on to the next site. This approach will repeat until all sites complete testing.

Equipment is located at various locations across the facilities and is identified as the following:

SYSTEM/SITE LOCATION	ADDRESS OR BUILDING NUMBER	SYSTEM/EQUIPMENT DESCRIPTION
Greenfield Water Tank	City of Greenfield	P25T, P2, 700 MHz Multisite

PASS/FAIL CRITERIA

Criteria for Pass / Fail is determined by execution of the test procedures in the Acceptance Test Plan. If a feature test is successfully executed, that feature is deemed to be compliant and results in a PASS. If a failure occurs, the failed test may be repeated to address missed steps or configuration requirements overlooked during execution.

If a certain piece of equipment is deemed to be malfunctioning and duplicate spare equipment is available to replace it, the test may be executed using the spare equipment. If the feature test is successfully executed on the spare equipment, the feature will be deemed compliant and result in a PASS. At such time as the original piece of equipment is repaired or replaced and is able to function as designed, the original equipment will be returned to service and tested to ensure functionality.

If a feature is found to be non-compliant, L3Harris will address the non-compliance and retest. Until a successful retest, the feature is deemed to be non-compliant and results in a FAIL.

If it is necessary to defer a test for any reason, it may be marked as Not Yet Evaluated (NYE). The test may be executed, with appropriate witnessing, at any time afterward to change the result to a PASS.

TROUBLE REPORTING

Any issues found during testing will first be recorded on the comment page at the end of the feature set, and then they will be reported directly to the L3Harris program manager to be logged in the project issues log for corrective action.

Failures must be appropriately addressed. For hardware failures occurring during test events, failed hardware will be removed from the system being tested and turned over to L3Harris' quality

organization for repair or replacement. Failures must be appropriately addressed. For hardware failures occurring during test events, failed hardware will be removed from the system being tested and turned over to L3Harris' quality organization for repair or replacement.

Test Procedures

FEATURES TO BE TESTED

The following list of acceptance procedures will be used to validate system performance:

- RF Site
- Symphony Dispatch Consoles

TOOLS / TEST EQUIPMENT

Unless otherwise specified, L3Harris will supply all special tools necessary to test the product.

Equipment list TBD during program planning.

EQUIPMENT MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

RADIO MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
TBD	TBD	TBD

Safety

L3Harris will take reasonable safety precautions to ensure personnel against harm while operating within and traversing the installations.

General safety guidelines for portable radios:

- Do not hold onto the antenna when the radio is powered on.
- To ensure you do not exceed FCC RF exposure compliance requirements, always keep the antenna at least 0.43 inches (1.1 cm) away from the body and 0.98 inches (2.5 cm) from the face when transmitting.
- Do not use the portable radio with a damaged or missing antenna. A minor burn may result if skin comes into contact with a damaged antenna. Replace a damaged antenna immediately. Operating a portable radio with the antenna missing could cause personal injury, damage the radio, and may violate FCC regulations.
- Use only manufacturer-approved antennas. Use of unauthorized antennas, modifications, or attachments could cause damage to the radio unit and may violate FCC regulations.
- RF energy from portable radios may affect some electronic equipment. Most modern electronic equipment in cars, hospitals, homes, etc., is shielded from RF energy. However, in areas in which you are instructed to turn off two-way radio equipment, always observe the rules. If in doubt, turn it off!

L3Harris engineering will identify environmental detriments prior to testing, if deemed applicable. L3Harris will make adjustments to the extent required to address any such deficiencies deemed to present a danger to either system performance or personnel safety; examples include excessive temperature variations, contaminants, hazardous materials, or obstructions to LMR equipment.

TEST PROCEDURES

SYSTEM FEATURE SET

P25 Trunked Calls and Site Features

SITE TRUNKING (FAILSOFT) INDICATION

Purpose: Demonstrate that radio displays a fail soft icon, when the site is unable to communicate with the system/network.

Expected Results: This test will verify that the radio will display an 'F' when the site it is logged into is not connected to the system.

Setup: Radios must be programmed to display fail soft.

DESCRIPTION	RADIO LID	TG DESCRIPTION	TG ID	SITE
Radio 1	9980001	TG 64001 P25	64001	1
Radio 2	9980002	TG 64001 P25	64001	1
Radio 3	9980003	TG 64001 P25	64001	2

Execution:

1. PTT Radio 1.
   > Verify that the Radio 1, Radio 2, and Radio 3 can communicate on the system.
2. Disconnect the network connection from the network switching center to the site router, causing loss of communication from the site back to the network switching center.
   > Verify that Radio 1 and Radio 2 indicate a fail soft alarm ("F") on their displays, this may take several minutes.
3. PTT Radio 1 on talkgroup A. Verify audio is heard at Radio 2. Verify audio is not heard on Radio 3.
4. Re-connect the network from the network switching center to the site router.
   > Verify the fail soft alarm disappears on the Radios and that communications with Radio 3 is reestablished.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

System Test Notes / Issues

System Functional Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

NETWORK SWITCHING CENTER FEATURE SET

Network Management

RF SYSTEM ALARMS INDICATIONS ARE REPORTED (RNM)

Purpose: Demonstrate the capability to monitor system faults and alarms at the RNM.

Expected Results: City of Greenfield Site equipment will send alarms to the RNM.

Setup: Need access to the site under test and the regional RNM. The alarm will need to be generated by equipment being physically powered-down or reset. Note the time of the alarm condition for later tests. On the 'RNM Domain' screen, verify all map icons are either green or blue. On the fault browser screen, delete any prior alarms.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with an Active Directory account.
   - > Choose the system map and select the 'Launch Application' button.
   - > Select the 'Network' tab and expand the tree in the left-hand panel until a site is in the right-hand panel.
2. Generate an alarm on a device (see chart) by powering down or otherwise disabling the device.
   - > Verify that the RNM Network Viewer indicates a site alarm for the affected device.
   - > Review alarm details by doing a right mouse click on an 'Alarm Object'. Select the desired menu option.
   - > Verify alarm is listed in the 'Fault Browser'.
3. Turn the device back ON.
   - > Verify that the device alarm clears and displays green.
4. Repeat Steps 2 - 3 for all equipment listed in the below chart.
5. Substitute https://s0u2rnm.vida.local/nmc and repeat test Steps 1 - 4 for the second RNM.
6. Record the results below for each site.

   Note: This form can be modified to reflect actual as-built alarms

SITE #		SITE NAME	
ALARM #	NAME	RESULTS (PASS/FAIL)	REMARKS
1	Traffic Controller		Press the reset button on the TC and watch for the alarm
2	Router		Remove cable from Gi0/0 (interface to SAS)
3	Switch		Remove a cable from a PLAN port
4	PA		Disable one of the site PAs

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

VIDA VIRTUAL SITE (VVS) SITE ALARM INDICATIONS ARE REPORTED (RNM)

FIELD TEST ONLY

Purpose: Demonstrate the capability to monitor site faults and alarms at the RNM.

Expected Results: Site level equipment will indicate faults and alarms at the RNM. During factory testing the alarm will be simulated by changing the active state polarity. During field acceptance testing the jumper alarm contacts will be opened or closed to simulate an alarm. An actual alarm could be monitored if the contacts have been connected.

Setup: This test verifies that the site and shelter alarms are connected to the new system and alarm names are programmed to show the alarm types and locations. Site specific digital alarm inputs connected to the alarm management system (Network Sentry) alarm unit.

Execution:

1. On a client computer, open the Windows Internet Explorer and browse to https://s0u1rnm.vida.local/nmc and log in with the Active Directory account.
2. Choose the system map and select the 'Launch Application' button.
3. Select the 'Network' tab and expand the tree in the left-hand panel until you can see a site in the right-hand panel.
4. Select a physical site to test alarm inputs.
5. Create a condition that will either simulate an alarm (jumper alarm contacts) or the actual event to trigger each alarm
   > Verify that the alarm is detected and displayed in the RNM Network Viewer and is listed in the 'Fault Browser.'
6. Clear the alarm condition.
   > Observe that the alarm indication has cleared in both the 'Network Viewer' and the 'Fault Browser.'
7. Repeat for each alarm and for each site in the system.
8. Record the results below for each site.

   Note: This form can be modified to reflect actual as-built alarms.

SITE #		SITE NAME	
ALARM #	NAME	RESULTS (PASS/FAIL)	REMARKS
1			
2			
3			
4			

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

NSC Test Notes / Issues

NSC Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

SYMPHONY CONSOLE FEATURE SET

RECEIVING CALLS (UNIT ID DISPLAY, TALKGROUP ID DISPLAY, ALIASING)

Purpose: Confirm Symphony operator can receive communications from a radio, using TG A.

Expected Results: Communications are initiated and received on appropriate speaker (select or unselect) and radio's ID is displayed.

Setup: Symphony has talkgroups A, B, and C configured with TG B selected.

Talkgroup Call

Execution:

1. Key radio and verify
   - > That call is heard at unselect speaker.
   - > Calling radio ID is displayed on module for TG.
   - > A green light ID displayed indicating an incoming call on module TG A.
2. Switch radios talkgroup to TG B and key radio.
   - > Verify call is heard at select speaker.
   - > Verify calling radio ID is displayed on TG B module.
   - > Verify a green light ID displayed indicating an incoming call on module for TG B.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Symphony Console Test Notes / Issues

Symphony Console Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

SUBSCRIBER UNIT FEATURE SET

GROUP TEST CALL

Purpose: A group test call will show that the site will allow a radio to communicate using a group call.

Expected Results: Test will demonstrate that all radios assigned to a common group will hear a call and all radios assigned to an uncommon group will not hear the call.

Setup: Make sure scan is turned OFF on the radios.

DESCRIPTION	TG DESCRIPTION
Radio A	TG A
Radio B	TG A
Radio C	TG A

Execution:

1. PTT Radio A and talk.
   - > The transmit (TX) indicators should turn on at Radio A.
   - > Audio should be heard in Radios B and C.
   - > The ID of Radio A should be seen on Radios 2 and 3.
2. Set Radio C to a different talk group. PTT on Radio A and talk.
   - > The transmit (TX) indicators should turn on at Radio A.
   - > Audio should be heard in Radio B only.
   - > The ID of Radio A should be seen at Radio B only.

TEST RESULTS		
Tester:		
Date:		
Result:	☐ Pass	☐ Fail

Subscriber Unit Test Notes / Issues

Subscriber Unit Test Acceptance

This Functional Test Acceptance Procedure has been fully and successfully completed with all action items resolved.

Customer Representative	L3Harris Technologies Representative
Signature	Signature
Printed Name and Title	Printed Name and Title
Date	Date

APPENDIX A – ACRONYMS AND DEFINITIONS

ACRONYM	DEFINITION
AD	Active Directory
AES	Advanced Encryption Standard
ATP	Acceptance Test Procedure
CAI	Common Air Interface (usually in reference to P25)
CME	Cisco Mobility Exchange (Telco Interconnect)
CNM	Central Network Manager, a L3Harris product
Confirmed Call	A confirmed call is a special type of call where the call is queued until all sites have resources available, or until the confirmed call timer expires (configurable, typically one or two seconds)
COTS	Commercial-off-the-Shelf
CPC	Channel Performance Criterion
DAQ	Delivered Audio Quality
DES	Digital Encryption Standard
LMR	Enterprise Land Mobile Radio
ESN	Electronic Serial Number (64 bits)
FDMA	Frequency Division Multiple Access
GID	Group ID (16 bit). This corresponds to a talkgroup. The group ID is unique within a VNIC and can be reused on other VNICs within the same WACN. Some of the older P25 documents refer to the GID as a talkgroup ID (TGID)
HA	High Availability
Individual Call	An individual call is a private call between one user and another. It can be between two radios, or between one radio and a dispatch console
KEK	Key Encryption Key
KID	16-bit encryption key ID
KMF	Key Management Facility
KMM	Key Management Message
LAN	Local Area Network
MASTR V	An L3Harris base station product
MES	Mobile End System, a subscriber radio
MME	Miniature mobility exchange, which consists of L3Harris software running on a SitePro card at the base site. The MME runs the SNDCP layer of the data protocol and is the equivalent of the P25 RFG (RF Gateway)

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SMT	System management terminal.
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SUMSplus	Version of SUMS
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TDMA	Time Division Multiple Access
TEK	Traffic Encryption Key
TGID	Talkgroup ID (16 bit, equivalent to GID). The P25 documents usually use GID but some of the older documents use TGID
Traffic Controller	Software entity that resides in a base station at the site and generates the P25 control channel
Tx	Transmit
UAC	Unified Audio Card

ACRONYM	DEFINITION
UAS	Unified Administration System
UKEK	User Key Encryption Key
UPS	Uninterrupted Power Supply
VAS	VIDA Application Server
VIDA	Voice, Interoperability, Data, Access (an L3Harris system product)
VLAN	Virtual Local Area Network
VM	Virtual Machine
VNIC	Voice Network Interface Controller, the L3Harris voice switch
VPN	Virtual Private Network
VTI	VIDA Telephone Interconnect
WACN	Wide area communication network (20 bit network ID, part of SUID). This is a customer network that can include many VNICs
WAR	Wide Area Router
Zeroize	A P25 control channel command which causes the mobile radio to erase its encryption keys (but then requires manual loading to restore encryption keys)

L3HARRIS™

COVERAGE CHARACTERIZATION TEST PLAN

Customer:
City of Greenfield, CA
(Greenfield)

Prepared by:
J Holliday

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About This Test

These procedures provide an accurate, statistically valid, repeatable, objective, and cost-effective method to characterize Greenfield**Error! Reference source not found.**'s coverage.

This Coverage Characterization Test Plan ("ATP"), where applicable, conforms with the requirements set forth in the latest revision of Telecommunications Industry Association ("TIA") Telecommunications Systems Bulletin TSB-88 titled "Wireless Communications Systems - Performance in Noise and Interference-Limited Situations - Recommended Methods for Technology-Independent Modeling, Simulation, and Verification". TSB-88 defines Channel Performance Criterion ("CPC") as the specified minimum design performance level in a faded channel and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog and digital voice systems.

L3Harris designs a balanced system such that uplink performance is comparable to downlink performance. Because of this design approach, the principal of reciprocity (as defined by TSB-88) ties the inbound predictions to the outbound test results in a mathematically predictable manner. In accordance with TSB-88, L3Harris will infer talk-in performance from the outbound test data.

SITE PERFORMANCE VALIDATION

As part of L3Harris' standard installation practices, L3Harris measures and record electrical measurements and timing parameters of equipment. L3Harris will provide these measurements to Greenfield as part of the final documentation package. These parameters may include:

- Base station output and reflected power
- Base station receiver sensitivity
- Receiver subsystem alignment parameters
- Time domain reflectometry of transmission line
- Combiner loss (if applicable)

Prior to conducting the testing procedures detailed in this document, L3Harris reviews each site to verify that the radio system is operating properly. The reviews verify the antenna configuration, the power into the antenna, the antenna installation, and the system channel used for test. L3Harris will provide all test equipment necessary to perform the reviews.

Definitions

SUBSCRIBER UNIT USAGE

All tests requiring subscriber (terminal) units in this document will use XL-185 or XL-200 Mobile and Portable radios. L3Harris will bench test and align all subscriber (terminal) radios prior to their use during coverage testing.

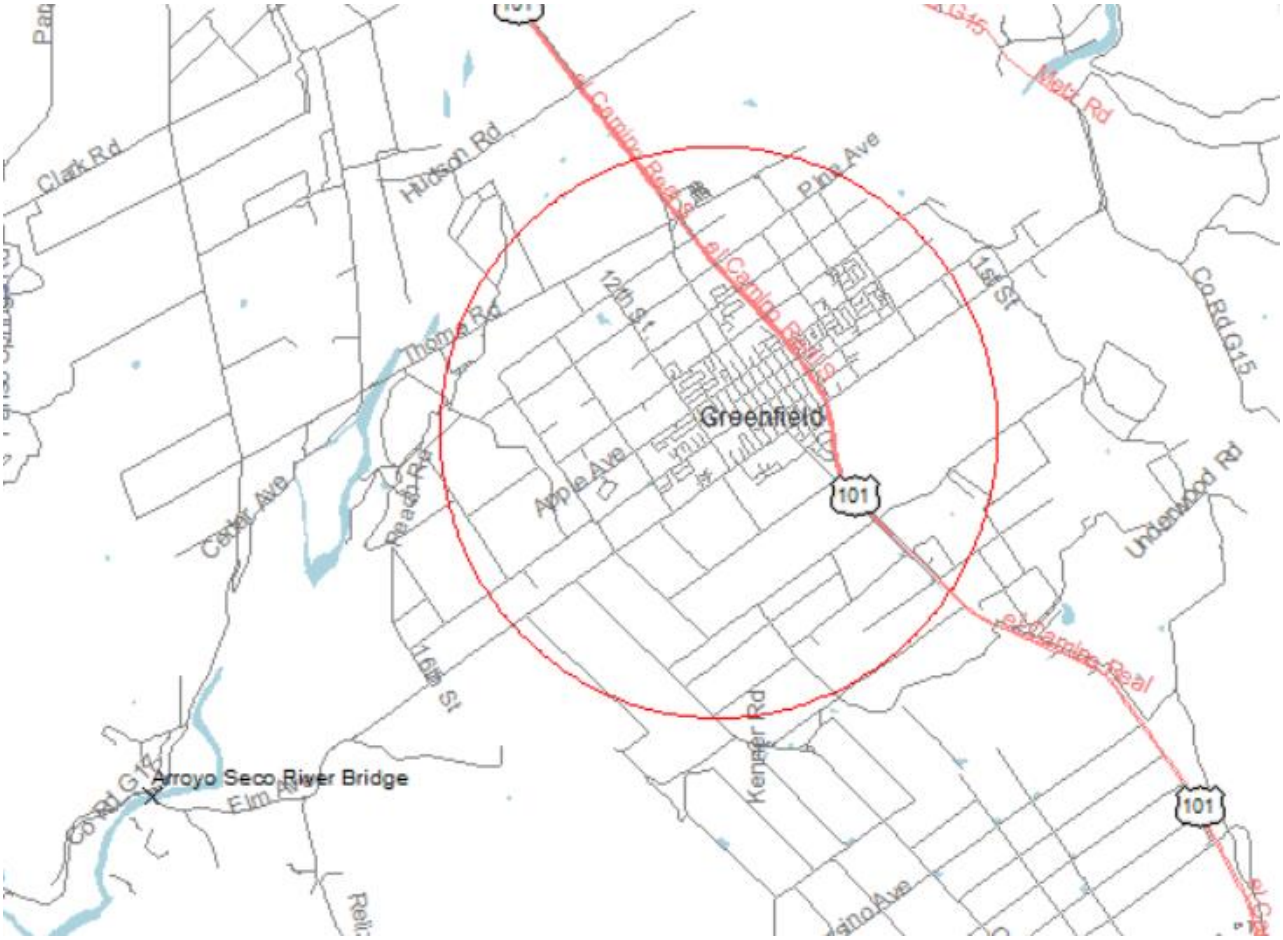
Test Vehicle Configuration

The non-stationary test equipment will mount inside one or more SUVs or vans, with external antennas mounted on the roof. The roof of the test vehicle(s) must not contain any other objects, including lightbars, roof racks, or other obstructions. All non-test radios must be off during testing. L3Harris may divide test equipment into multiple test vehicles. L3Harris will determine the number of test vehicles required and which tests, if any, can be run concurrently.

SERVICE AREA

TSB-88 defines a service area as a boundary of the geographic area of concern for a user, and states that Validated CPC Service Area Reliability is the percentage of test locations in the bounded service area that meet or exceed the specified CPC. L3Harris is using a Bounded Area design for Greenfield as defined in TSB-88 wherein coverage predictions are made out to the boundary of the defined service area and coverage verification occurs throughout the service area out to the boundary through the performance of a Validated CPC Service Area Reliability test. The service area is a two-mile radius around the location of the water tower and also the Arroyo Seco River Bridge. The service area is shown in Figure 1.

Figure 1. Greenfield Service Area



SERVICE AREA GRID STRUCTURE

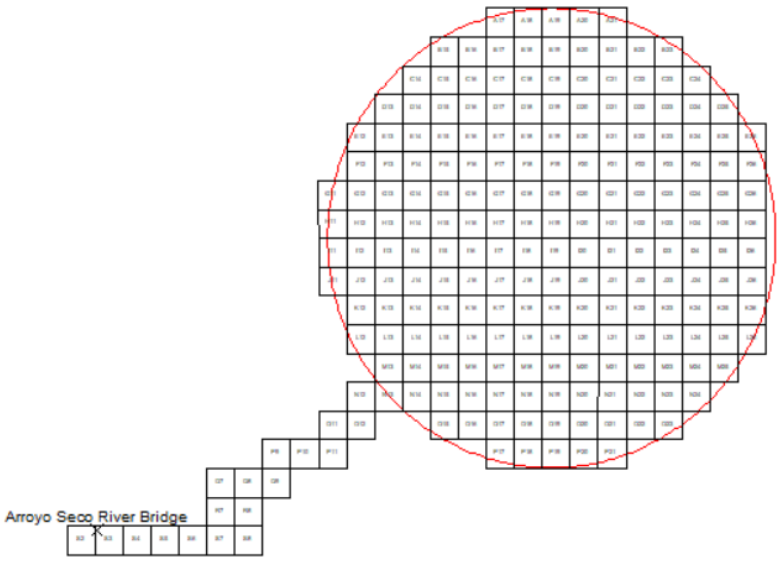
TSB-88 recommends coverage verification measurements at a statistically significant number of random test locations, uniformly distributed throughout the service area. L3Harris divides the service area by a test grid pattern using TSB-88 Estimate of Proportions analysis to determine the number and size of the test tiles. This analysis provides both statistically significant measurement results and a high confidence that the results are a true indication of the installed radio system coverage.

Figure 2Figure 2 provides L3Harris' recommended tile sizes to obtain a uniform distribution of tiles throughout the service area(s).

Figure 2. Service Area, Tile Size, and Tile Count

SERVICE AREA DEFINITION	TILE SIZE (MILES)	APPROXIMATE TILE COUNT
Greenfield Service Area	0.25 × 0.25	220

Figure 3. Greenfield Service Area Tile Structure



The grid pattern overlays onto street maps and the drive test team will navigate through all accessible tiles (i.e., those having roads traversable by the test vehicle) within the defined service area boundaries. Based on the US Census Bureau TIGER roads database, L3Harris estimates 190 tiles are accessible within the service area. To include as many test tiles as possible, L3Harris assumes the following roads may be accessible:

- Primary roads
- Secondary roads
- Local roads (streets)
- Ramps

- Service drives

The final determination on accessibility will be made by the drive test team based on the conditions they encounter. The following are examples of tiles that will be deemed inaccessible:

- Tiles that require special permission from property owners to access (not counting cases where the Customer has obtained or provided permission)
- Tiles that are hazardous to navigate or may result in the test vehicle becoming stuck or damaged
- Tiles that require clearing of brush, debris, or other obstacles before the vehicle can enter
- Tiles that do not have road access

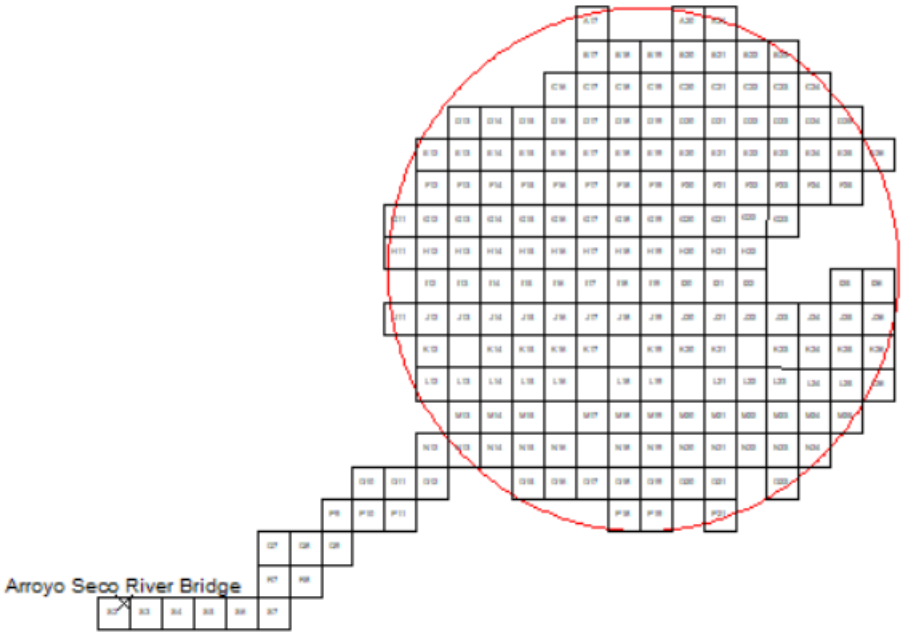
The test team should not pass through tunnels, underpasses, underground garages, or other man made obstructive areas where radio coverage is not planned or expected while testing. If they do pass through any of these areas while testing, L3Harris may disable the TYPHON test unit to prevent collection of data in these areas, or discard results collected in these areas.

Measurements will be made in all accessible tiles within the defined service area boundaries. L3Harris does not use test measurements outside of each service area boundary. Any areas or accessible tiles within the service area boundary that Greenfield decides not to test will score as a PASS in the reliability calculations.

L3Harris will discard inaccessible tiles (i.e., those having no roads) from the reliability calculations with the acceptance criteria adjusted by treating the inaccessible tiles as exclusion zones.

The accessible tile structure is shown in Figure 4.

Figure 4. Greenfield Service Area Accessible Tile Structure



DELIVERED AUDIO QUALITY

TSB-88 defines Channel Performance Criterion (CPC) as the specified minimum design performance level in a faded channel and provides a set of Delivered Audio Quality (DAQ) CPCs that define subjective voice quality performance applicable to both analog and digital voice systems. The DAQ definitions are in Figure 5.

Figure 5. Delivered Audio Quality Scale Definitions

DELIVERED AUDIO QUALITY	SUBJECTIVE PERFORMANCE DESCRIPTION
DAQ 5.0	Speech easily understood.
DAQ 4.5	Speech easily understood. Infrequent Noise/Distortion.
DAQ 4.0	Speech easily understood. Occasional Noise/Distortion.
DAQ 3.4	Speech understandable with repetition only rarely required. Some Noise/Distortion.
DAQ 3.0	Speech understandable with slight effort. Occasional repetition required due to Noise/Distortion.
DAQ 2.0	Understandable with considerable effort. Frequent repetition due to Noise/Distortion.
DAQ 1.0	Unusable, speech present but unreadable.

STAKEHOLDER RESPONSIBILITIES

Greenfield to provide:

- Any non-automobile test vehicles required for the testing (e.g., boats for water-based coverage testing)
- A driver / operator for any customer-provided test vehicles
- Customer representative(s) to participate in tests as necessary
- Access to the test areas as may be required in each test procedure

L3Harris to provide:

- SUV/van for roads-based drive testing
- A driver for L3Harris-provided vehicles
- Drive test measurement equipment
- Representatives to operate this equipment and execute the test procedures
- Representative(s) to participate in tests as necessary
- Final test results

Talk-Out Bit Error Rate (BER) Characterization

This test characterizes RF coverage by measuring talk-out (base to mobile) BER throughout the service areas defined in Section 1.

SETUP

L3Harris uses its TYPHON wireless testing system to measure BER. TYPHON consists of L3Harris terminal radios, a GPS receiver to provide accurate position information for each measured data point, a computer with an internal clock that coordinates and records the test data, roof mounted antennas, and variable attenuators for use when testing portable coverage.

The TYPHON equipment mounts inside the test vehicle (SUV/van) and has an external antenna(s) mounted on the outside, centrally located on the vehicle's roof, without other equipment installed on the roof.

When characterizing portable coverage, a variable attenuator installs in the test vehicle between the radio and the external antenna to simulate portable operations on the hip for both outdoor and indoor operation. For portable outdoor coverage characterization, the variable attenuator is set to the appropriate level to account for portable body losses. For portable indoor coverage characterization, the variable attenuator is set to account for the portable body losses plus the loss of the building category under evaluation. Variable attenuator values, where applicable, are shown in Figure 6.

Figure 6. Coverage Service Area, Body/Building Loss, and Attenuator Values

SERVICE AREA DEFINITION AS SHOWN IN FIGURE 2	DESCRIPTION	BODY LOSS (DB)	BUILDING LOSS (DB)	ATTENUATOR VALUE (DB) [1]
Greenfield Service Area	Portable Outdoor	8 dB	0 dB	8 dB
Greenfield Service Area	Portable Indoor	8 dB	20 dB	28 dB
Greenfield Service Area	Portable Indoor	8 dB	25 dB	33 dB
Greenfield Service Area	Portable Indoor	8 dB	30 dB	38 dB

DATA MEASUREMENTS

Each radio system base station site continuously transmits a P25 test pattern data sequence on a working channel (in a simulcast system, the same working channel is used for each simulcast site). The TYPHON equipment inside the test vehicle collects measurements of this signal every 3 seconds as it is driven along the defined test drive route. The software in the TYPHON laptop computer automatically records the BER as reported by the terminal radio for each 3-second measurement data record along the test drive route.

[1] *Attenuator value accounts for portable body loss and antenna gain and will be finalized prior to acceptance testing based on actual equipment configuration.*

DATA ANALYSIS

As defined by Section 5 of TSB-88.3, latest revision, L3Harris post-processes all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis. Measurements that have a BER equal to or less than 2.4 % record as PASS, the remainder record as FAIL.

RESULTS PRESENTATION

L3Harris plots the data records on a map showing the test tiles, the areas tested and the test results. Different colors show ranges of measured BER. An included test report summarizes the test results.

Talk-Out Signal Strength Characterization Test

This test characterizes RF coverage by measuring talk-out (base to mobile) signal strength throughout the bounded service areas defined in Section 1.

SETUP

This test will use L3Harris's TYPHON wireless testing system to measure coverage performance. TYPHON uses calibrated test receivers to produce repeatable measurement results in conformance with industry standards. L3Harris maximizes the accuracy of test measurements through periodic calibration of the TYPHON system and using its integrated automated hardware and software that minimizes the likelihood of procedural errors. TYPHON can configure with up to four industrial grade measurement receivers to provide RSSI data for single or multiple sites, a GPS receiver to provide accurate position information for each measured data point, a computer with an internal clock that coordinates and records the test data, and a roof mounted antenna. TYPHON contains multiple receivers to facilitate gathering data simultaneously from several multi-sites or simulcast sites at common measurement locations.

DATA MEASUREMENTS

The TYPHON equipment mounts inside the test vehicle (a large van or SUV is recommended) with an external antenna mounted on the outside and centrally located on the vehicle's roof, without other equipment installed on the roof.

Each radio system base station site transmits either on the control channel, or an unmodulated carrier on one selected working channel. The equipment makes measurements of this signal at equal distance intervals throughout the entire drive route. The TYPHON equipment, operating at a minimum 1000 Hz sampling rate, operates in the "40λ Wave Distance Average" analysis mode. With the test vehicle in motion[1] along the drive route, a local mean signal measurement is made every 40-wavelengths[2]. By averaging a minimum of 200 data points within each 40-wavelength measurement window, the estimated mean value is within ±1 dB of the actual value with 99% confidence.

DATA ANALYSIS

As defined by Section 5 of TSB-88.3, latest revision, L3Harris post-processes all mean measurement data records collected from the drive test within the defined service area boundary, with data records recorded every 0.1-mile (typically) used in the final analysis.

For each service area, L3Harris adjusts the minimum acceptable signal level at a portable radio to the mobile measurement reference point using the loss factors shown in Figure 7 (e.g., portable body loss, excess signal required to penetrate each random building category). A comparison is made between the

[1] Vehicle velocity must not exceed 60 miles per hour to ensure an adequate number of points over the measurement window.

[2] 40 wavelengths for UHF, 800 MHz, and 900 MHz. 20 wavelengths for VHF 150 MHz.

mean measurement points in the service area, and this adjusted minimum level, denoting the adjusted signal threshold.

Figure 7. Coverage Service Area and Signal Level

SERVICE AREA DEFINITION AS SHOWN IN FIGURE 2	DESCRIPTION	MINIMUM REQUIRED SIGNAL LEVEL (DBM)	BODY LOSS (DB)	BUILDING LOSS (DB)	ADJUSTED SIGNAL THRESHOLD (DBM) [1]
Greenfield Service Area	Portable Outdoor	-110 dBm	8 dB	0 dB	-102 dBm
Greenfield Service Area	Portable Indoor	-110 dBm	8 dB	20 dB	-82 dBm
Greenfield Service Area	Portable Indoor	-110 dBm	8 dB	25 dB	-77 dBm
Greenfield Service Area	Portable Indoor	-110 dBm	8 dB	30 dB	-72 dBm

RESULTS PRESENTATION

L3Harris plots the data records on a map showing the test tiles, the areas tested, and the test results. Different colors show ranges of measured mean signal levels. An included test report summarizes the test results.

[1] *Adjusted Signal Threshold accounts for portable body loss and antenna gain and will be finalized prior to acceptance testing based on actual equipment configuration.*

System Parameters

Figure 8. System Design Parameters

Site Name		Greenfield Water Tower
Site ID		GWT
Latitude		36° 19' 03.371" N
Longitude		121° 14' 58.808" W
Datum		NAD27
Site Elevation		292 ft
Base Station		MASTR V
Frequency Range		764 - 806 MHz
Site Transmit	Station Output Power	63.1 W
	Combiner Model	DSCC75 (4 ch.)
	Tx to Tx Spacing	250
	Combiner Loss	2.4 dB
	Filter/Duplexer Model	CP05470
	Filter/Duplexer Loss	0.3 dB
	Coax Type	7/8" Foam
	Coax Length	110 ft
	Coax Loss	1.2 dB
	Antenna Model	SC46A-HF1LDF(D00-PIP)
	Antenna Height (C.L)	60 ft
	Antenna Azimuth	237°
	Antenna Mechanical Tilt	0°
	Antenna Gain (Hzn)	10.0 dBd
	Maximum ERP (Hzn)	257.0 W
	HAAT	-431.0 ft
Site Receive	Total System Gain	7.3 dB
	Multicoupler Model	CP00933-6MHzDC (8 ch.)
	Coax Type	7/8" Foam
	Coax Length	110 ft
	Tower Top Amp Model	CP00732
	TTA Pad	0.0 dB
	Distribution Pad	7.5 dB
	Duplexer Loss	0.0 dB
	Antenna Model	SC46A-HF1LDF(D00-PIP)
	Antenna Height (C.L)	60 ft
	Antenna Azimuth	0°
	Antenna Mechanical Tilt	0°
	Antenna Gain (Hzn)	10.0 dBd
	HAAT	-431.0 ft

Monterey County CA Land Mobile Radio LMR System Upgrade

Radio Cutover Plan

Prepared for:

MONTEREY COUNTY, CA

Rev. 2, September 4, 2024

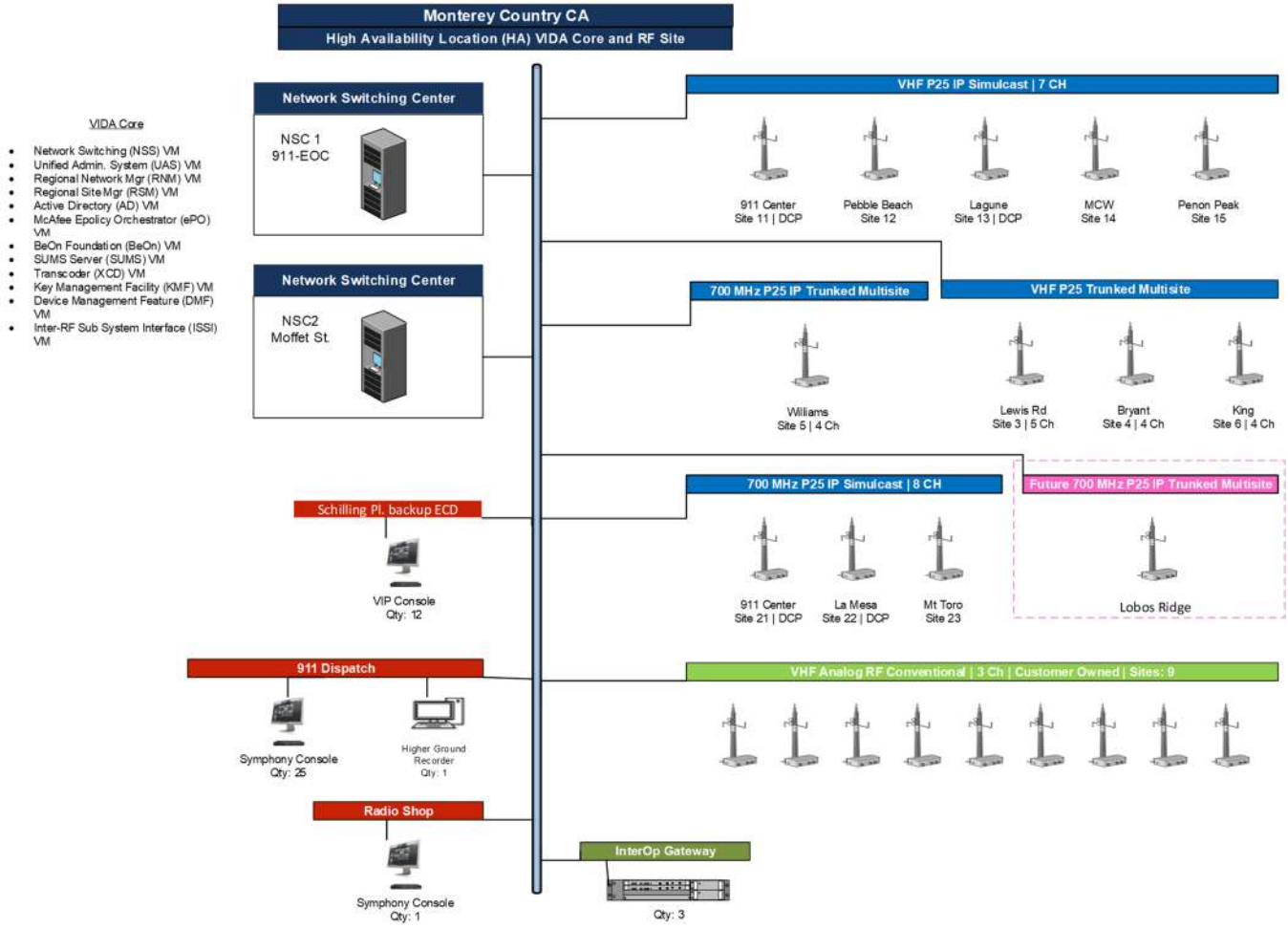
Contents

Purpose

The purpose of this cutover allows Monterey Country to take advantage of the new features introduced in SR10A.7.

1. Current System Overview

- System is a 2 simulcast (1 VHF 7 channels and 1 700 MHz 8channels) and 4 multisite system with 3~4 channels each running on a VIDA Premier Geographically Separated High Availably (HA) Core and 2 dispatch locations. All site and dispatch consoles are P25 phase 2 capable: Sites are currently configured to run only P25 phase 1 (full rate).



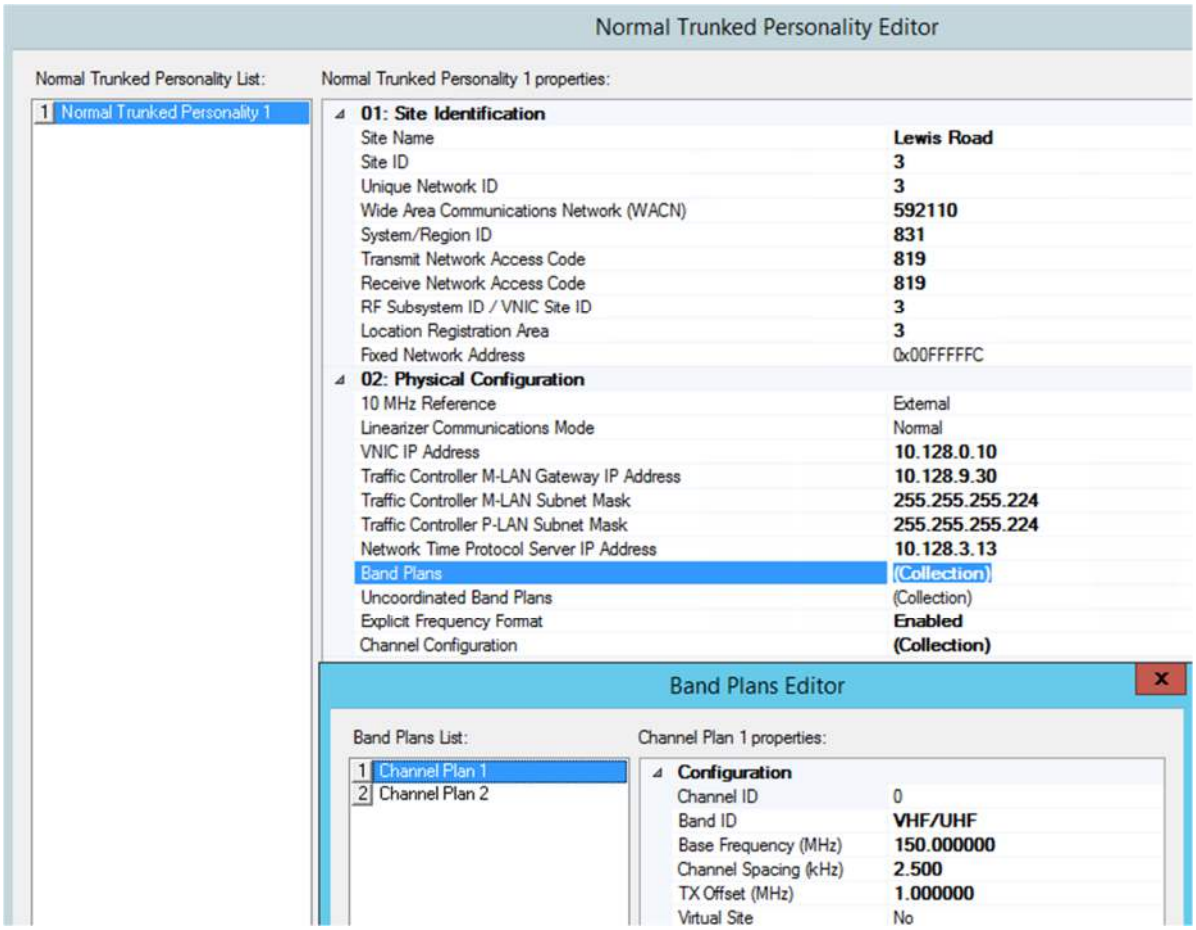
1.1 Current Radio IDEN table

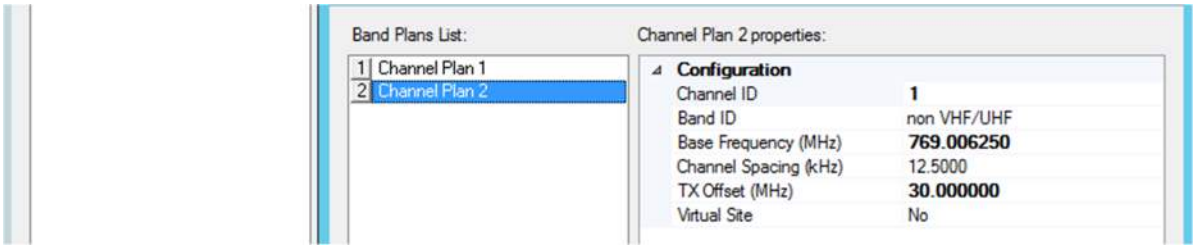
Name	# Entries	Base Frequency (MHz)	TX Offset (MHz)	Channel Spacing (kHz)	Bandwidth (kHz)	Type
MONTEREY	1	150	0	2.5	12.5	FDMA Full Rate
MONTEREY	2	769.00625	30	12.5	12.5	FDMA Full Rate

1.2 Current VHF site IDEN table

Explicit Frequency Format enabled.

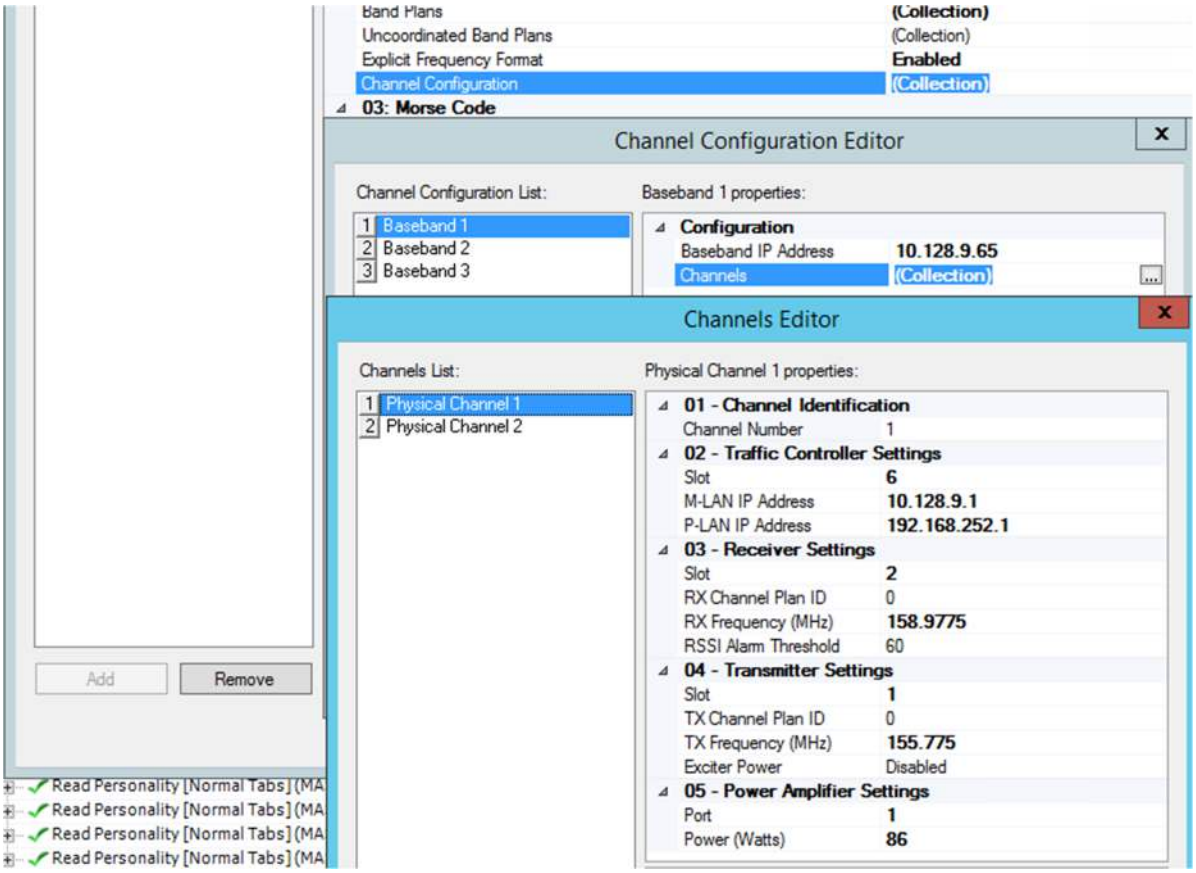
Channel ID	Band ID	Base Frequency (MHz)	Channel Spacing (kHz)	TX Offset (MHz)	Virtual Site
0	VHF/UHF	150	2.500	1.000	No
1	Non VHF/UHF	769.00625	12.500	12.5	No

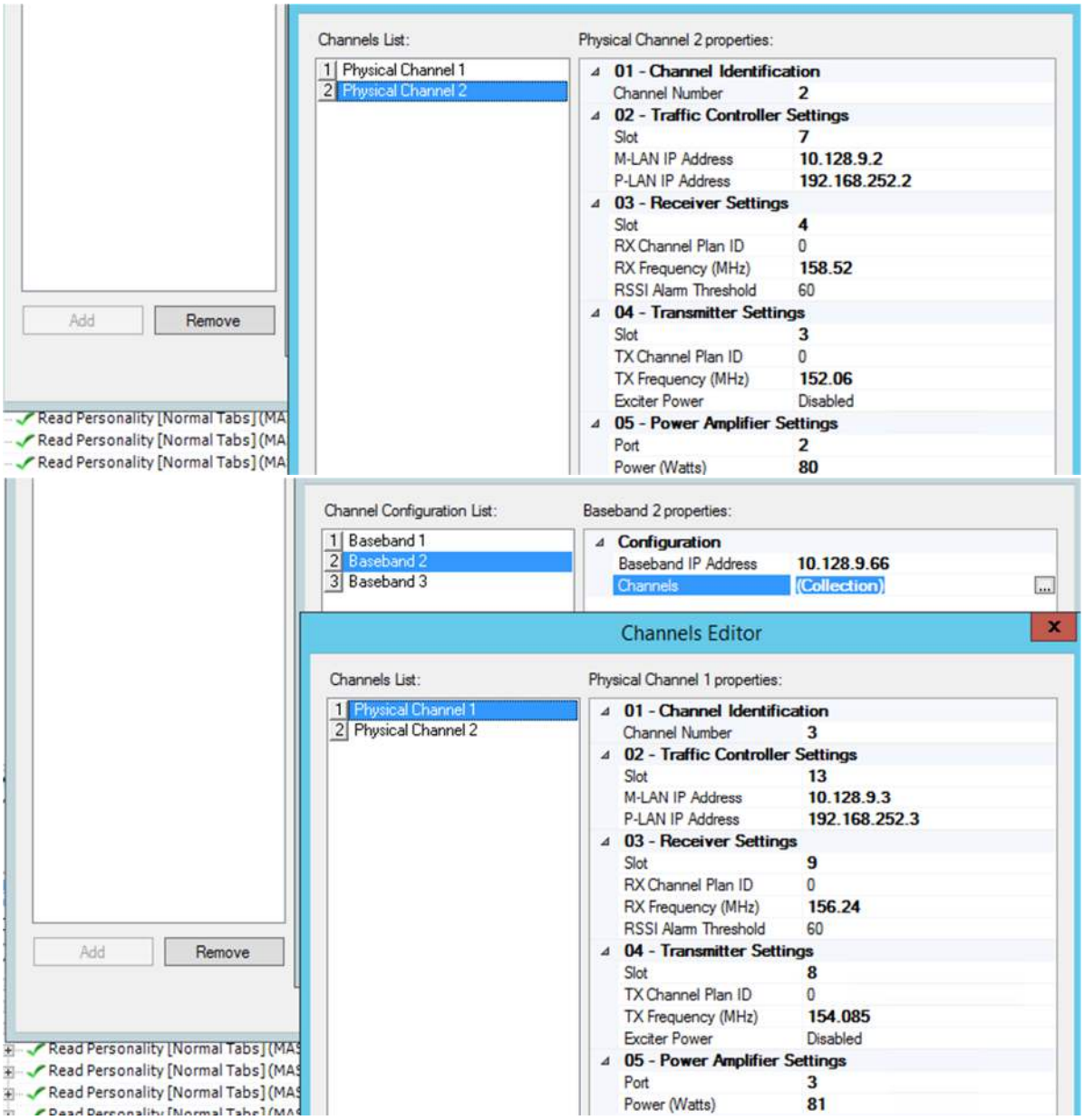


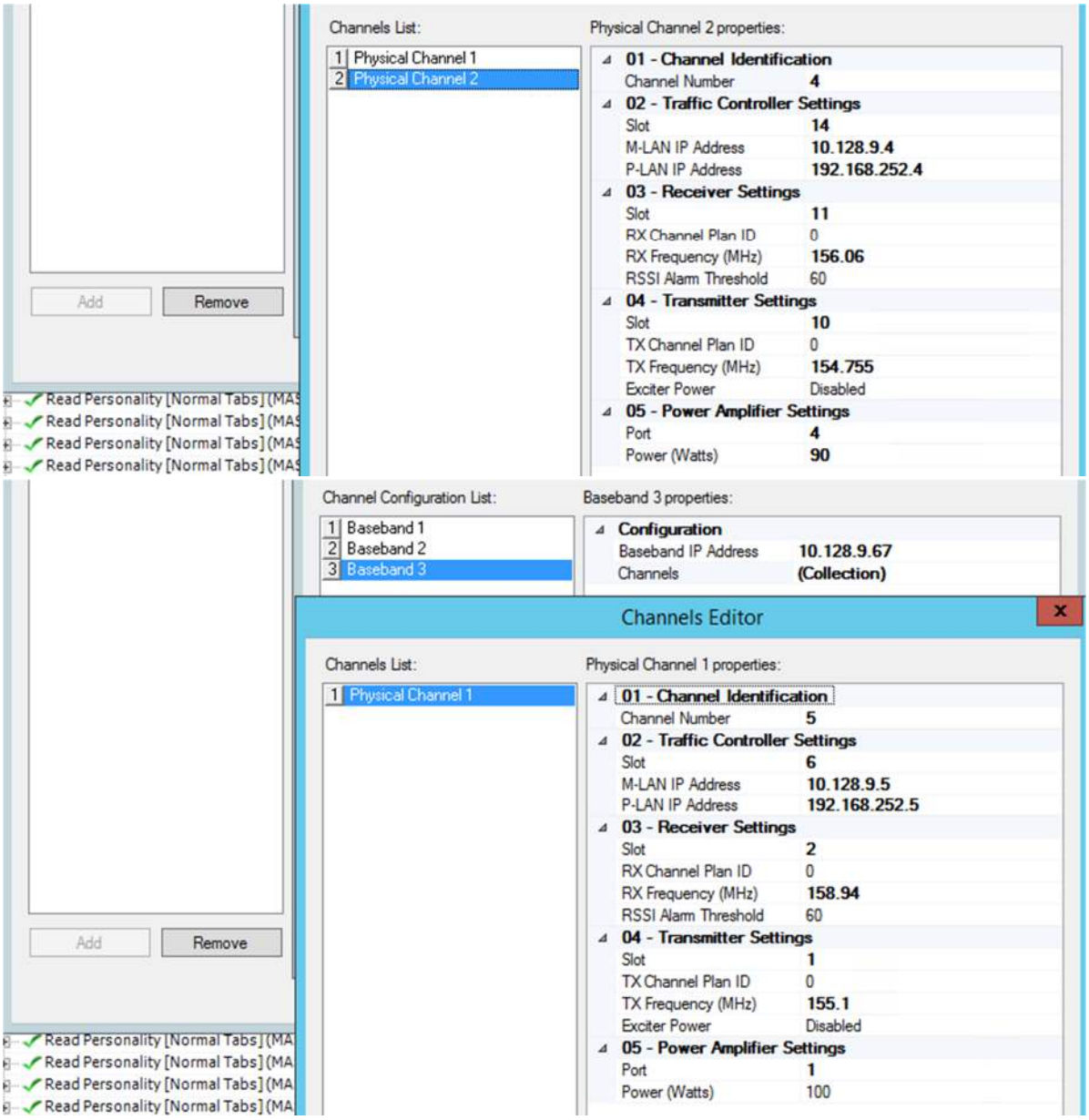


All the Tx and Rx Channel Plan ID are set to 0.

Baseband #	Physical Channel #	Channel #	Channel type	Frequency (MHz)	Plan ID
1	1	1	Rx	158.9775	0
1	1	1	Tx	155.775	0
1	2	2	Rx	158.52	0
1	2	2	Tx	152.06	0
2	1	3	Rx	156.24	0
2	1	3	Tx	154.085	0
2	2	4	Rx	156.06	0
2	2	4	Tx	154.755	0
3	1	5	Rx	158.94	0
3	1	5	Tx	155.1	0



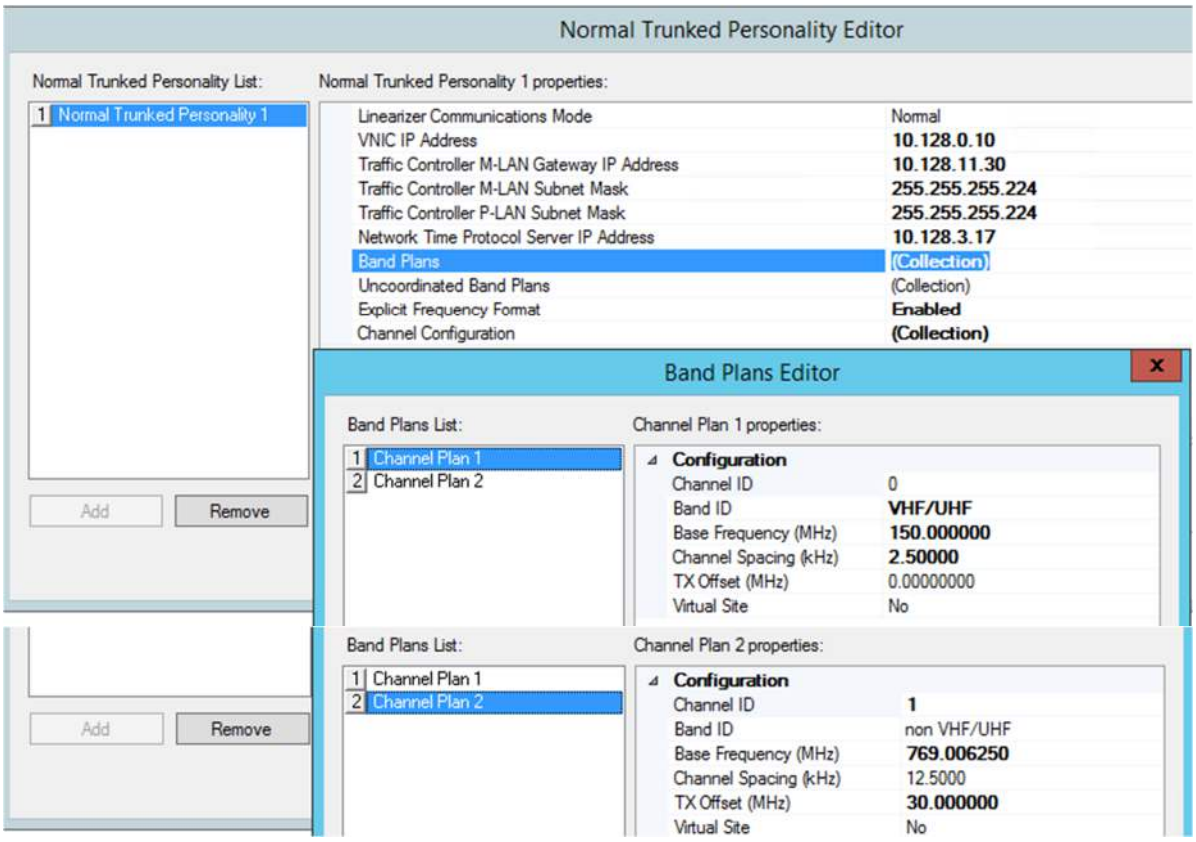




1.3 Current 700MHz site IDEN table

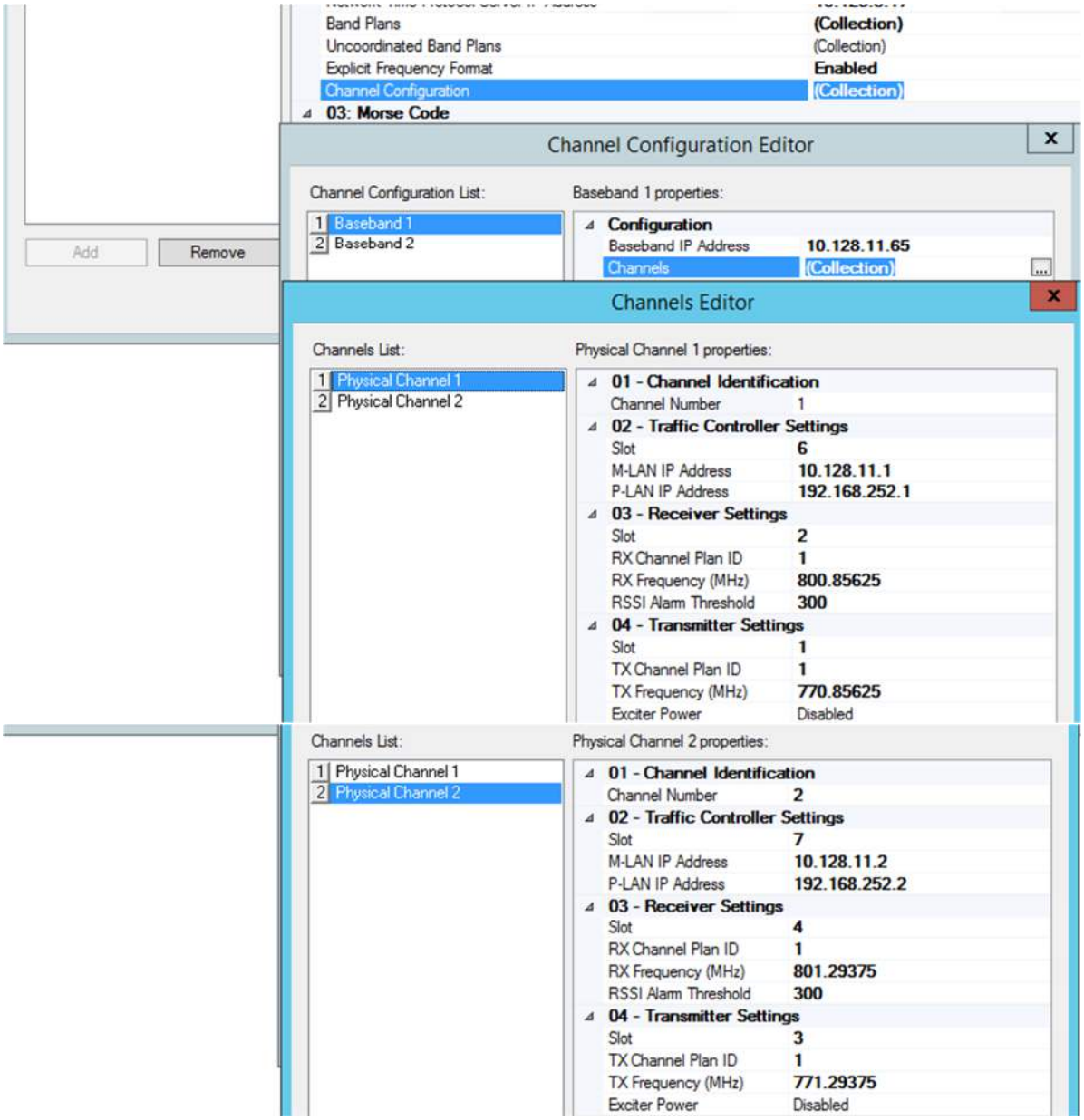
Explicit Frequency Format enabled.

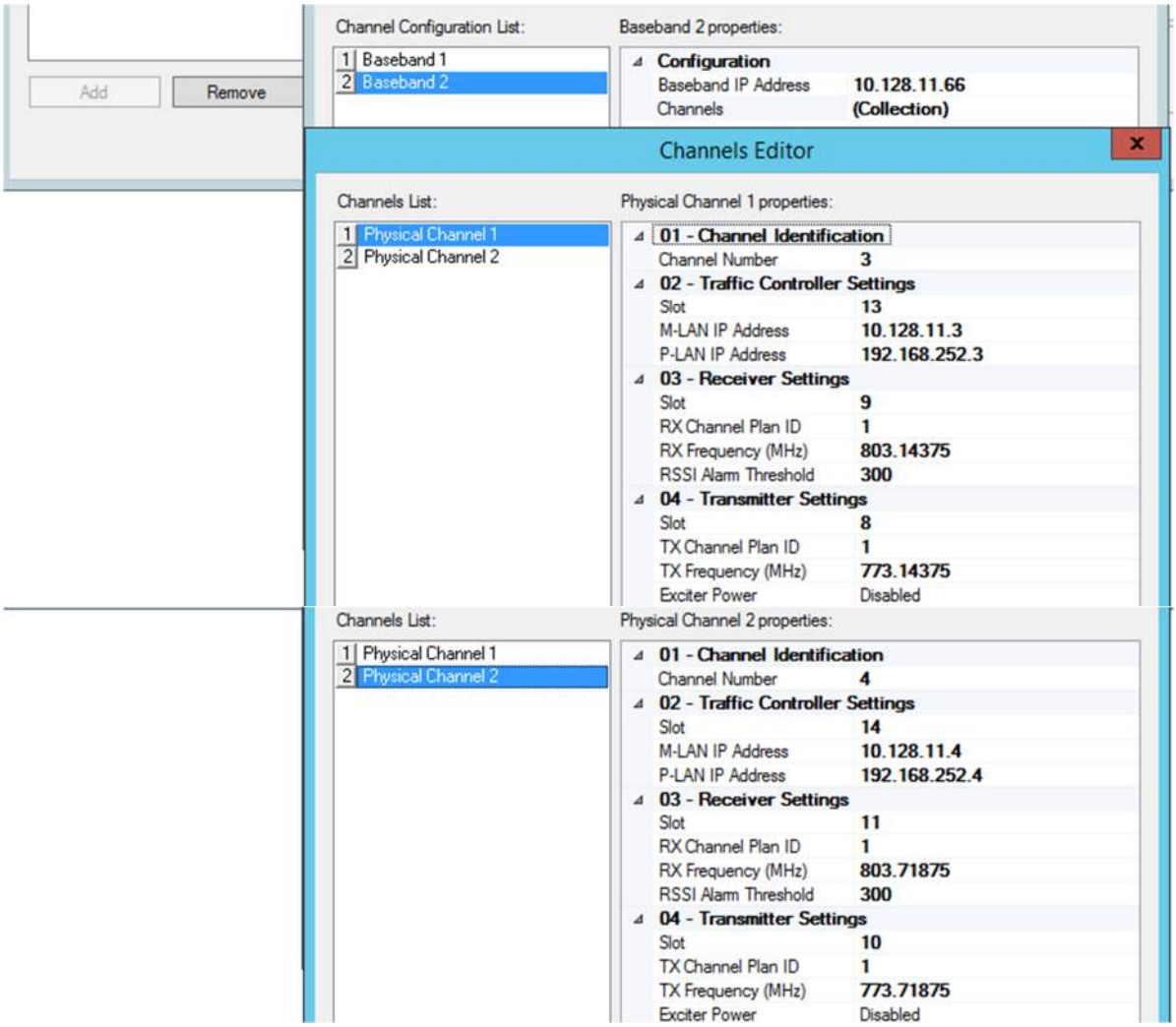
Channel ID	Band ID	Base Frequency (MHz)	Channel Spacing (kHz)	TX Offset (MHz)	Virtual Site
0	VHF/UHF	150	2.500	1.000	No
1	Non VHF/UHF	769.00625	12.500	12.5	No



All the Tx and Rx Channel Plan ID are set to 1.

Baseband #	Physical Channel #	Channel #	Channel type	Frequency (MHz)	Plan ID
1	1	1	Rx	800.85625	1
1	1	1	Tx	770.85625	1
1	2	2	Rx	801.29375	1
1	2	2	Tx	771.29375	1
2	1	3	Rx	803.14375	1
2	1	3	Tx	773.14375	1
2	2	4	Rx	803.71875	1
2	2	4	Tx	773.71875	1





2. Summary of Cutover Plan

2.1 Radio personality reprograming for preparing for the sites to switch over to P25 phase2 (half Rate)

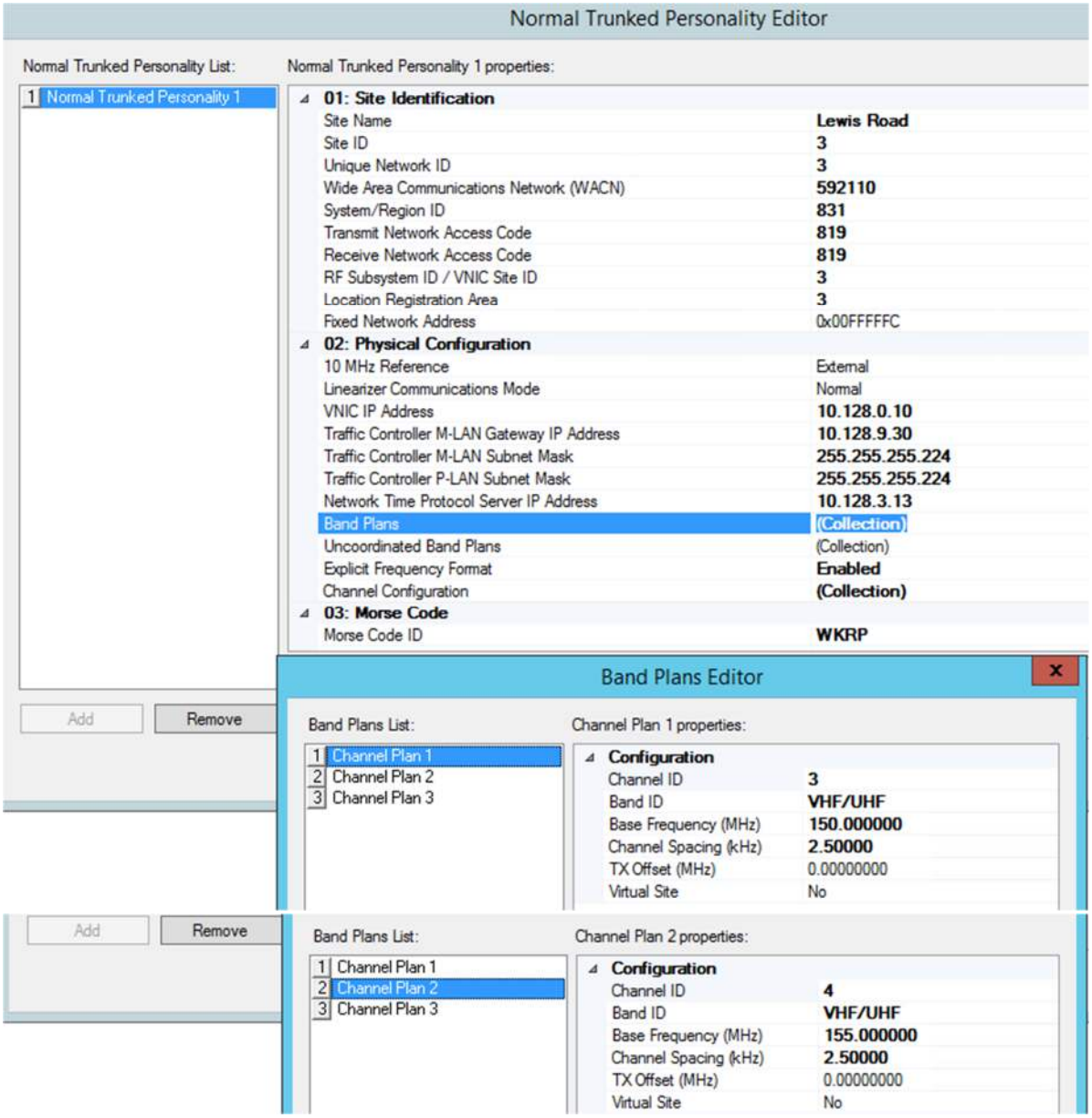
Name	Type	# Entries	Base Frequency (MHz)	TX Offset (MHz)	Channel Spacing (kHz)	Bandwidth (kHz)	Type_1
MONTEREY	Default Channel IDEN						
MONTEREY		1	150	0	2.5	12.5	FDMA Full Rate
MONTEREY		2	769.00625	30	12.5	12.5	FDMA Full Rate
MONTEREY		4	150	0	2.5	12.5	FDMA Full Rate
MONTEREY		5	155	0	2.5	12.5	FDMA Full Rate
MONTEREY		6	769.00625	30	12.5	12.5	FDMA Full Rate
MONTEREY		12	150	0	2.5	12.5	TDMA 2 Slot
MONTEREY		13	155	0	2.5	12.5	TDMA 2 Slot
MONTEREY		14	769.00625	30	12.5	12.5	TDMA 2 Slot

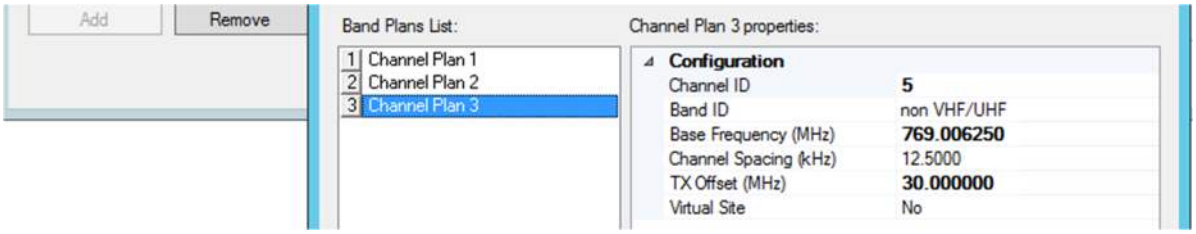
2.2 Sites to enable P25 phase 2 (half rate) operation.

2.2.1 For VHF Sites

Explicit Frequency Format enabled.

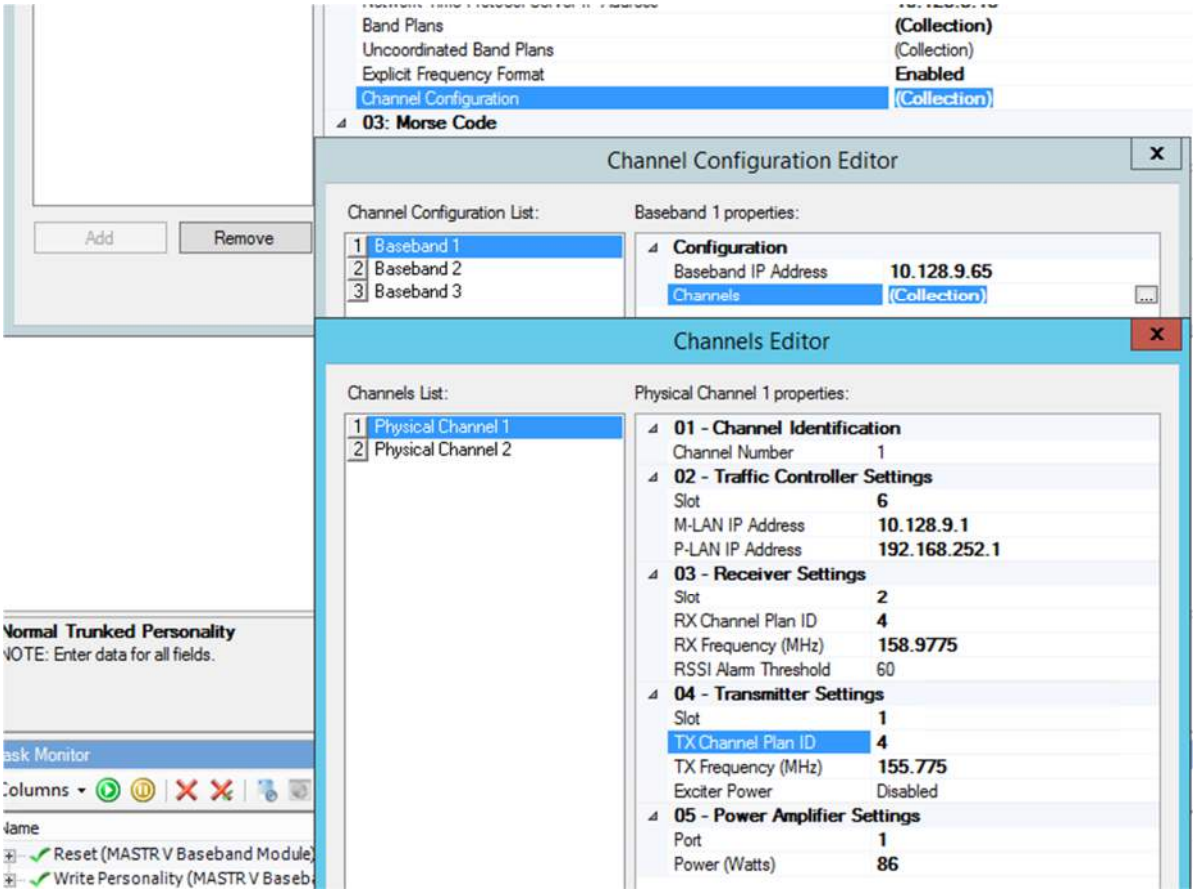
Channel ID	Band ID	Base Frequency (MHz)	Channel Spacing (kHz)	TX Offset (MHz)	Virtual Site
3	VHF/UHF	150	2.500	0.000	No
4	VHF/UHF	155	2.500	0.000	No
5	Non VHF/UHF	769.00625	12.500	12.5	No

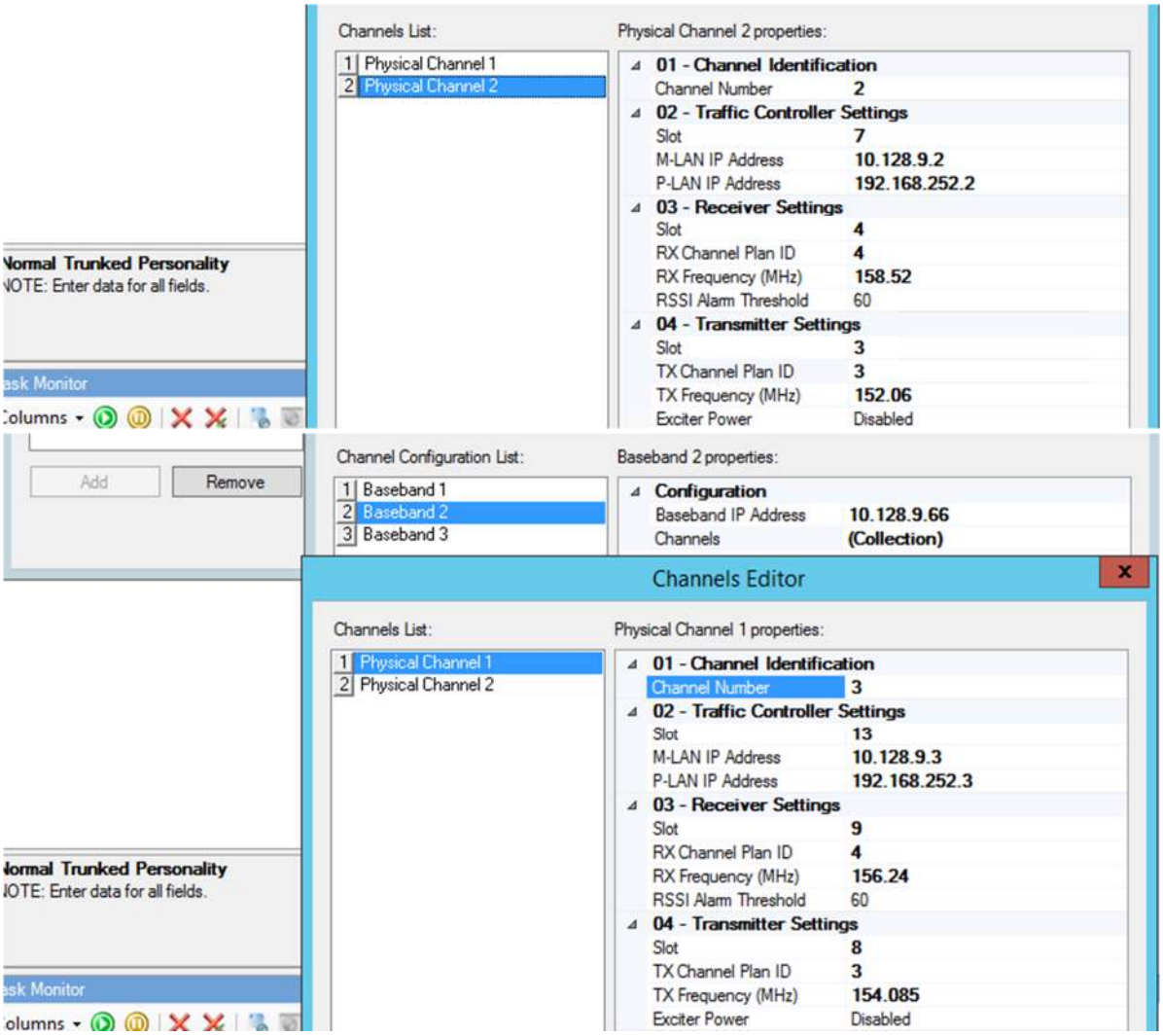


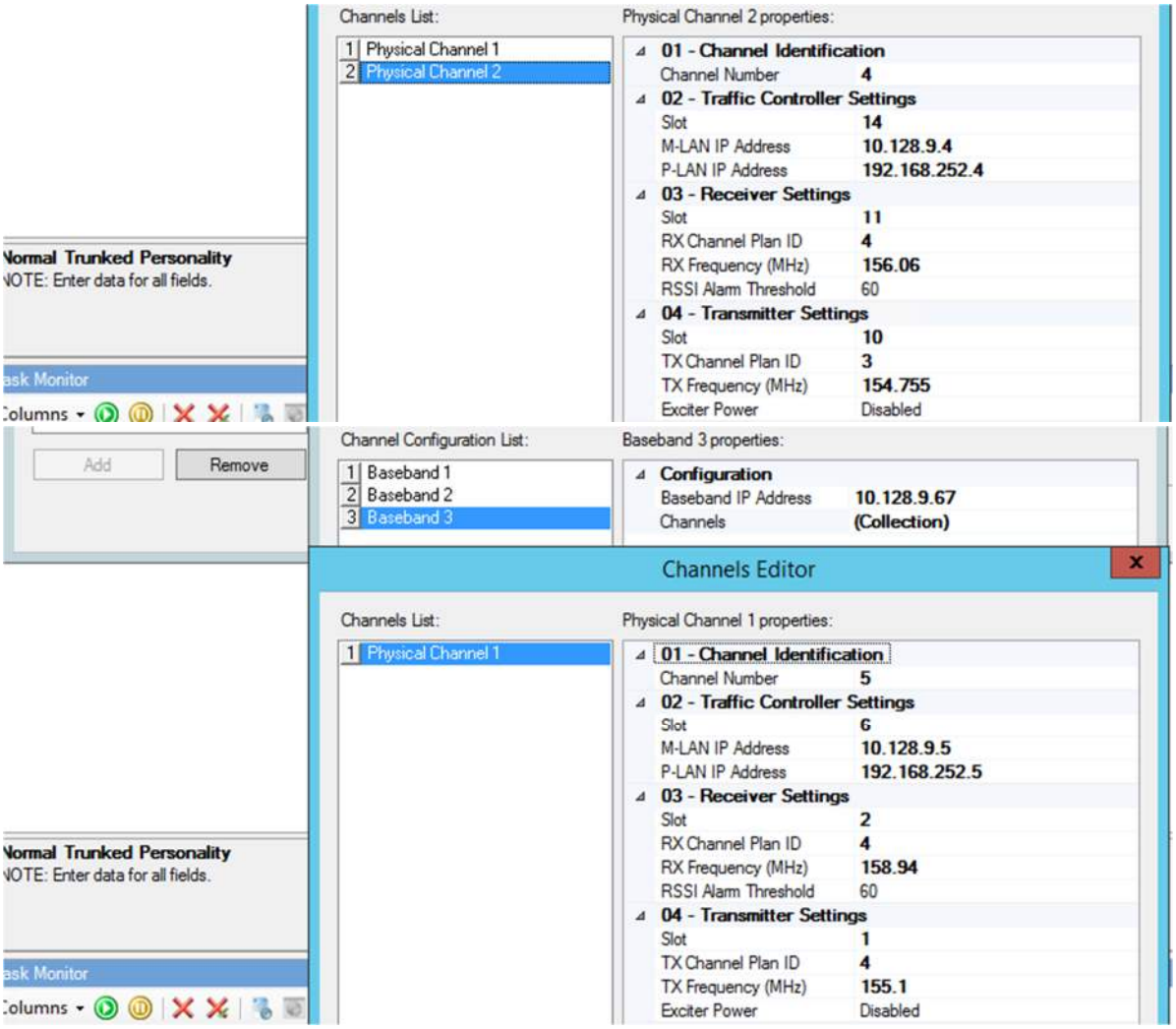


Setting for Tx and Rx Channel Plan ID:

Baseband #	Physical Channel #	Channel #	Channel type	Frequency (MHz)	Plan ID
1	1	1	Rx	158.9775	4
1	1	1	Tx	155.775	4
1	2	2	Rx	158.52	4
1	2	2	Tx	152.06	3
2	1	3	Rx	156.24	4
2	1	3	Tx	154.085	3
2	2	4	Rx	156.06	4
2	2	4	Tx	154.755	3
3	1	5	Rx	158.94	4
3	1	5	Tx	155.1	4





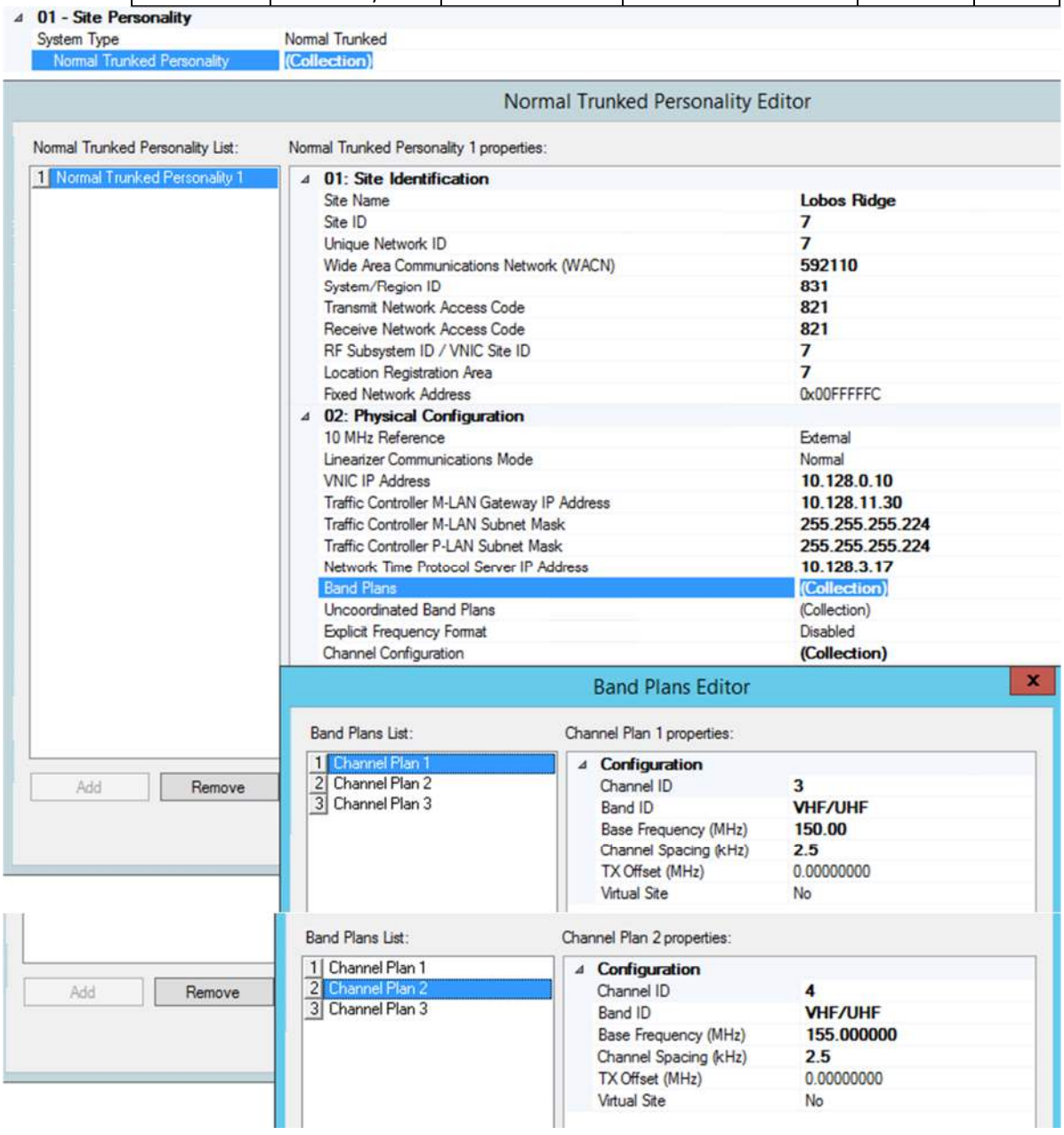


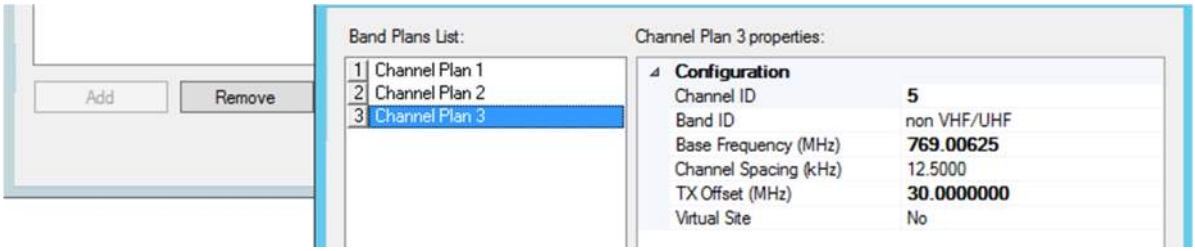
Note: After writing the personality to all the site the Basebands, a reset is required.

2.2.2 For 700MHz sites

Explicit Frequency Format disabled.

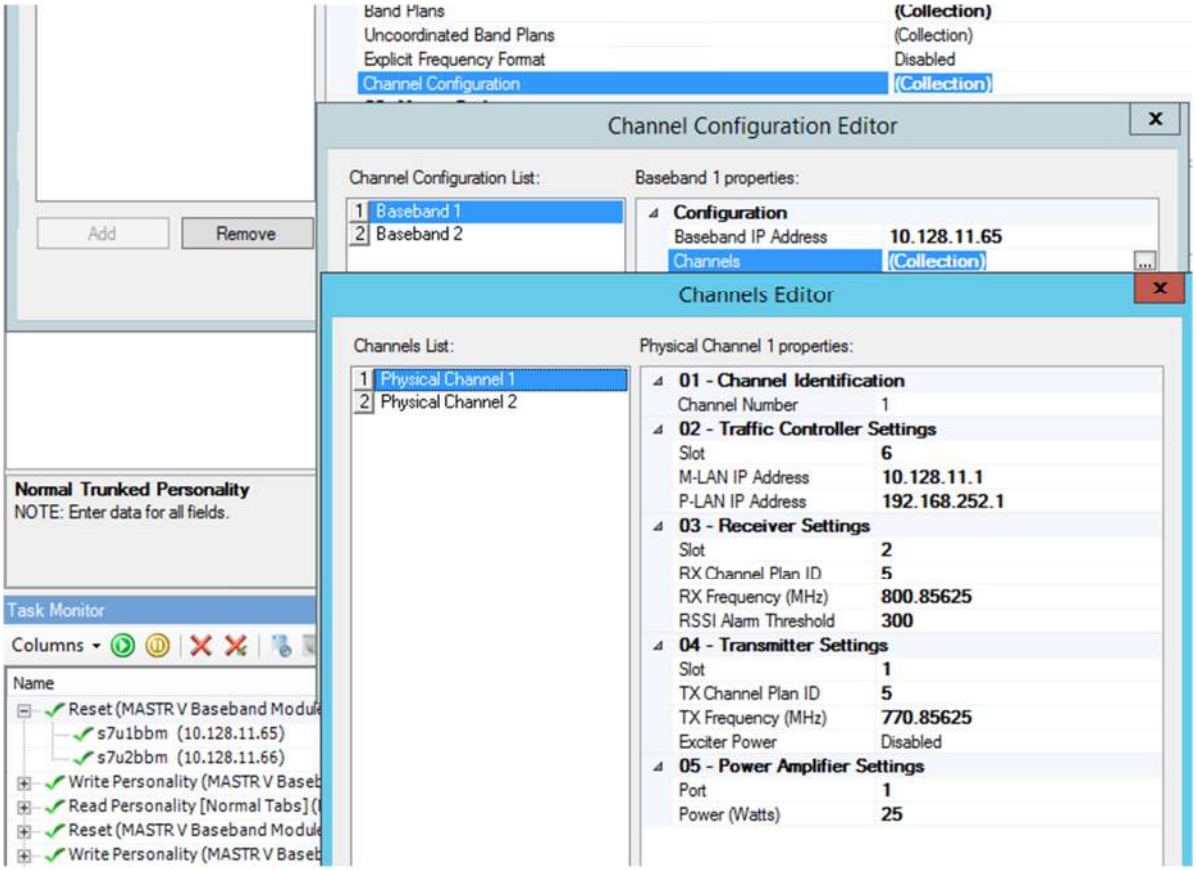
Channel ID	Band ID	Base Frequency (MHz)	Channel Spacing (kHz)	TX Offset (MHz)	Virtual Site
3	VHF/UHF	150	2.500	0.000	No
4	VHF/UHF	155	2.500	0.000	No
5	Non VHF/UHF	769.00625	12.500	12.5	No

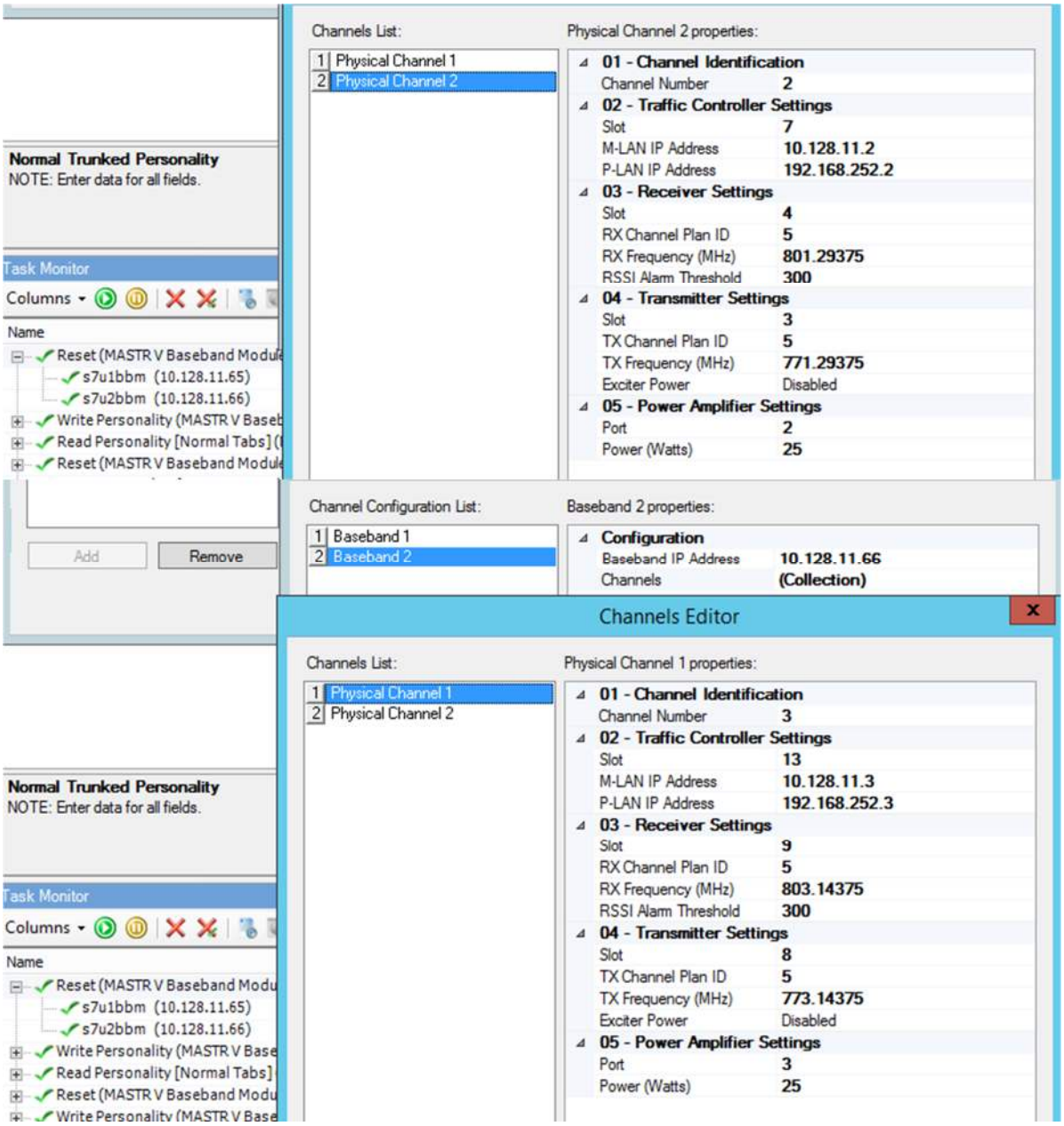


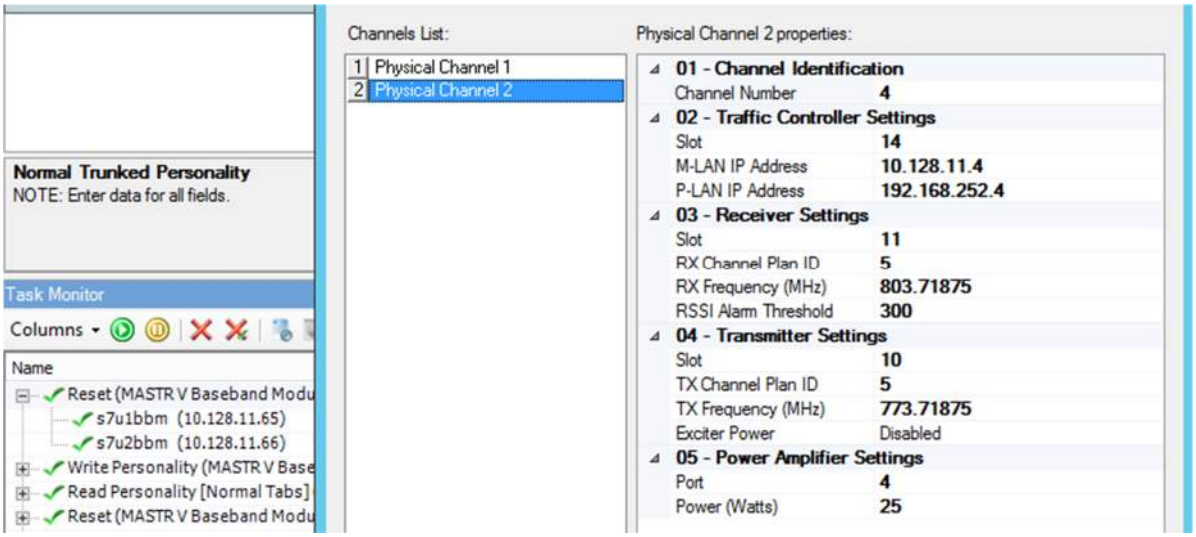


Setting for the Tx and Rx Channel Plan ID:

Baseband #	Physical Channel #	Channel #	Channel type	Frequency (MHz)	Plan ID
1	1	1	Rx	800.85625	5
1	1	1	Tx	770.85625	5
1	2	2	Rx	801.29375	5
1	2	2	Tx	771.29375	5
2	1	3	Rx	803.14375	5
2	1	3	Tx	773.14375	5
2	2	4	Rx	803.71875	5
2	2	4	Tx	773.71875	5



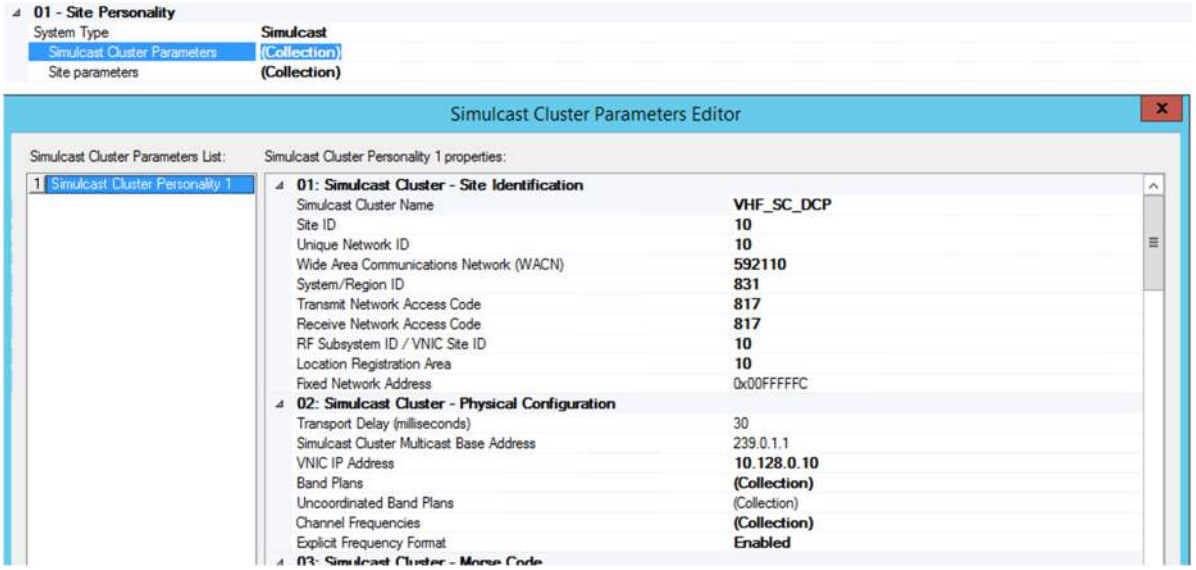




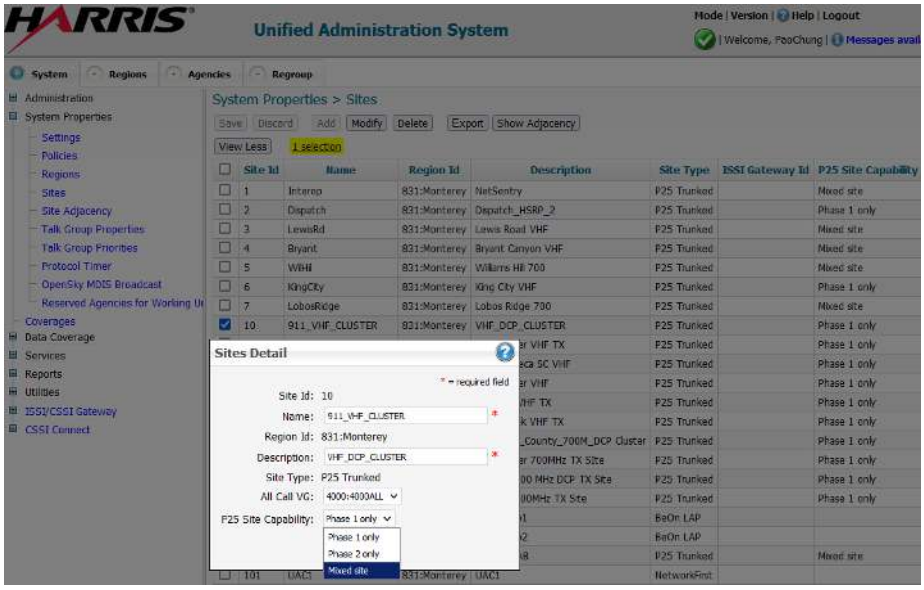
Note: After writing the personality to all the site the Basebands, a reset is required.

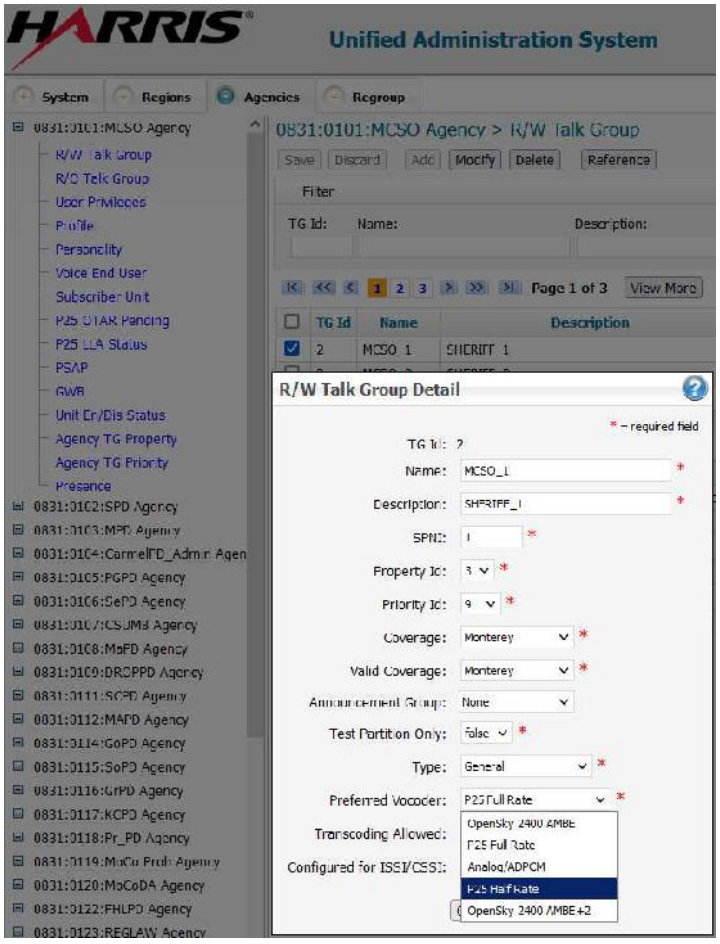
2.2.3 Simulcast Site

For Simulcast site, the IDEN table and channel Plan ID is located under Simulcast Cluster Parameters.



2.2.4 UAS changes





3. Quick Test

Prepare 6 radios for the test.

- One Harris P25 phase 1 only radio with existing IDEN table.
- One Motorola P25 phase 1 only Radio with existing IDEN table.
- One Harris P25 phase 1 only radio with new IDEN table.
- One Motorola P25 phase 1 only Radio with new IDEN table.
- One Harris P25 phase 2 radio with new IDEN table.
- One Motorola P25 phase 2 Radio with new IDEN table. (Or another Harris radio)

3.1 Testing all 6 radios work with existing VHF and 700MHz sites.

3.1.1 Able to make call at the site and listen to calls.

3.1.2 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

3.1.3 Move to another type of site (from VHF to 700MHz site)

3.1.4 Able to make call at the site and listen to calls.

3.1.5 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

3.2 Switch one VHF and one 700MHz site to the new half rate setting.

3.3 Confirm all radios with existing IDEN table work will not work on the new VHF and 700MHz sites.

3.4 Testing all P25 phase 2 radios with the new IDEN table work with existing VHF and 700MHz sites. (Make sure the Phase 1 only radios are turn off)

3.4.1 Able to make call at the site and listen to calls.

3.4.2 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

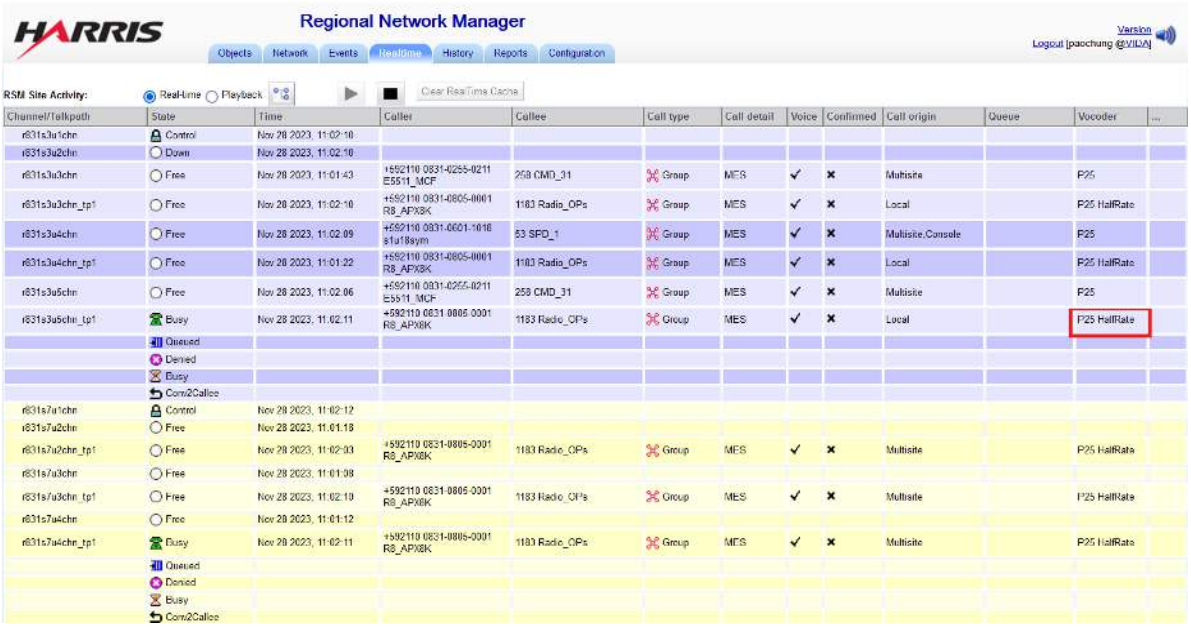
3.4.3 Move to another type of site (from VHF site to 700MHz site)

3.4.4 Able to make call at the site and listen to calls.

3.4.5 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

3.5 verify P25 phase 2 (half rate) operation.

Log into the RNM and in Realtime tab select VNIC Group Calls, make a call from one of the P25 half rate capable radio on a P25 half rate talkgroup.



3.6 Testing all P25 phase 1 only radios with the new IDEN table work with existing VHF and 700MHz sites.

3.6.1 Able to make call at the site and listen to calls.

3.6.2 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

3.6.3 Move to another type site (from VHF site to 700MHz site)

3.6.4 Able to make call at the site and listen to calls.

3.6.5 Key up then let go and rekey to verify it can talk on all channels within the site. Use RNM real time viewer to verify this.

4. Expected Outages

- Radio that had not been reprogramed to include the new IDEN entries will not be able to register to the system, hence not working.
- If a radio is not P25 half rate capable and listening on the same talkgroup, the site will switch that channel to full rate.

PRICING SUMMARY

L3Harris is pleased to provide Monterey County with the following firm fixed price proposal. Pricing is valid through September 30, 2024. Upon expiration of the pricing validity, L3Harris reserves the right to provide an updated pricing proposal.

P25 SYSTEM UPGRADE EQUIPMENT	Quantity	List Price (USD $)	Sourcewell Discount +	Price (USD $) - Sourcewell Contract Pricing
NSC 1: Primary VIDA Premier Core Replacement (911 ECD)	Lot	$440,904.47	26%/10%	$295,900.13
NSC 2: Secondary VIDA Premier Core Replacement (Moffet St.)	Lot	$349,534.69	26%/10%/0%	$260,786.87
Shilling Pl (S32) Network H/W	Lot	$3,156.00	26%	$2,335.44
911 Center (S91) Network H/W	Lot	$8,612.00	26%	$6,372.88
Radio Shop (S30) Network H/W	Lot	$3,156.00	26%	$2,335.44
911 Center (S31) Network H/W	Lot	$2,750.00	26%	$2,035.00
911 Center (S91) Console SDP Replacement	Lot	$319,930.00	26%	$236,748.20
Radio Shop (S30) Console SDP Replacement	Lot	$13,910.00	26%	$10,293.40
Shilling Pl (S32) Console SDP Replacement	Lot	$27,820.00	26%	$20,586.80
P25 SYSTEM UPGRADE EQUIPMENT SUBTOTAL				**$837,394.16**
Estimated Sales Tax (9.25%)				**$77,458.96**
P25 SYSTEM EQUIPMENT SUBTOTAL (after estimated taxes)				**$914,853.12**

P25 SYSTEM EQUIPMENT (GREENFIELD)	Quantity	List Price (USD $)	Sourcewell Discount +	Price (USD $) - Sourcewell Contract Pricing
RF Site Equipment	Lot	$284,403.50	26%	$210,484.19
P25 Talkpath Licenses	Lot	$8,000.00	26%	$5,920.00
Antenna System	Lot	$16,820.00	26%/10%	$14,804.40
DC Power Plant	Lot	$17,307.00	0%	$17,307.00
P25 SYSTEM EQUIPMENT SUBTOTAL				**$248,515.59**
Estimated Sales Tax (9.25%)				**$22,987.69**
P25 SYSTEM EQUIPMENT SUBTOTAL (after estimated taxes)				**$271,503.28**

PROFESSIONAL SERVICES	Quantity	List Price (USD $)	Sourcewell Discount +	Price (USD $) - Sourcewell Contract Pricing
Engineering, Program Management, Staging, Freight, Final Testing and System Acceptance	Lot	$1,293,310.00	0%	$1,293,310.00
PROFESSIONAL SERVICES SUBTOTAL				**$1,293,310.00**
SYSTEM TOTAL				*$2,208,163.12*
PROJECT TOTAL				**$2,379,219.75**
PROJECT TOTAL (after estimated taxes)				**$2,479,666.40**

OPTIONS (not included in the above pricing) **Must be executed before System Acceptance**				
OPTIONAL ITEMS	**Quantity**	**List Price (USD $)**	**Sourcewell Discount [+]**	**Price (USD $) - Sourcewell Contract Pricing**
Optional Infrastructure Spares	Lot	$51,335.00	26%	$37,987.90
Optional Symphony Console Spare H/W	Lot	$32,810.00	26%	$24,279.40
Optional Greenfiled Spares	Lot	$93,239.00	26%/10%	$70,279.26

***Sales Taxes are estimated at current rates and are subject to fluctuation at time of final invoicing*
State and Local taxes not included

Milestone Payments	**Value**	**Scheduled Billing Date**
Contract Execution (10%)	$237,921.98	2024-09-30
Detailed Design Review (10%)	$237,921.98	2025-06-25
L3H Procurement of Equipment (20%)	$475,843.95	2025-09-25
Equipment Staging @ Factory (20%)	$475,843.95	2025-10-24
Infra Equipment Shipment (10%)	$237,921.98	2025-11-10
Estimated Taxes*	$100,446.65	2025-11-10
Installation (15%)	$356,882.96	2026-06-10
Final Testing and System Acceptance (15%)	$356,882.96	2026-07-09
Total Milestone Payments	**$2,479,666.40**	

*Estimated taxes are based on taxible materials only at a rate or 9.25%. This is an estimate only and subject to change based on tax rate changes, additional district taxes, and or material changes.

[+] Discount varies by item type in accordance with Sourcewell Contract

Exhibit B – Payment Schedule

L3Harris Project Total	**$2,479,666.40**		
Cost Allocation Subtotals			
NGEN Share (Core Upgrade)	$ 1,909,343.13	77%	
City of Greenfield Share (New Site)	$ 570,323.27	23%	

Fiscal Year	Milestone Payments	L3Harris Total Invoice	L3Harris Invoice Percentage	FY Totals	NGEN Cost Share (77%)	NGEN Cost FY Totals	City of Greenfield Cost Share (23%)	City of Greenfield Cost FY Totals
FY24-25	Contract Execution	$ 237,921.98	10%	$ 475,843.96	$ 183,199.92	$ 366,399.85	$ 54,722.06	$ 109,444.11
	Detailed Design Review	$ 237,921.98	10%		$ 183,199.92		$ 54,722.06	
FY25-26	L3H Procurement of Equipment	$ 475,843.95	20%	$ 1,290,056.53	$ 366,399.84	$ 993,343.53	$ 109,444.11	$ 296,713.00
	Equipment Staging at Factory	$ 475,843.95	20%		$ 366,399.84		$ 109,444.11	
	Infrastructure Equipment Shipment	$ 237,921.98	10%		$ 183,199.92		$ 54,722.06	
	Taxes (Estimated 9.25% of Equipment)	$ 100,446.65			$ 77,343.92		$ 23,102.73	
FY26-27	Installation	$ 356,882.96	15%	$ 713,765.92	$ 274,799.88	$ 549,599.76	$ 82,083.08	$ 164,166.16
	Final Testing and System Acceptance	$ 356,882.96	15%		$ 274,799.88		$ 82,083.08	
	Grand Total	**$ 2,479,666.40**	**100%**	**$ 2,479,666.40**	**$ 1,909,343.13**	**$ 1,909,343.13**	**$ 570,323.27**	**$ 570,323.27**

Rehan Muzaffer
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August 28, 2024

Re: Cost breakout from current project proposal for adding 1 new site to Monterey County Radio System.

Dear Mr. Montoya,
Please be advised that per your request, we ran finacial analysis on incremental cost of adding 1 more site to County of Monterey LMR system as part of SR11 core and dispatch upgrade project.
We ran our analysis on L3Harris Technologies, Inc.'s proposal to County of Monterey dated August 2024.
This proposal, in addition to core and dispatch console upgrades, also added 1 new RF site in the City of Greenfield.
Addition of this new site is approximately 23% of the total overall cost of this project, whereas the core and console upgrades represents 77% of the total overall project costs.
I hope this breakout provides better visibility into specific costs associated with the new RF site addition to the network.

Best Regards

Signed by:
6D3459D123DA40C...
9/10/2024 | 11:35 AM PDT