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1. Amendment #3 Description

This Statement of Work (SOW) includes the following.

1. SR10A.1 Upgrade & BeOn Licensing
2. Console Upgrade
3. REA 21

Amendment #3 Order Signing

The Project shall begin upon execution of Amendment #3, which is the start date from which all schedule activities are measured.

1.1 SR10A.1 Upgrade

Whereas PR9C is based on a Sun SPARC server, SR10A.1 is based on a Dell server that has increased processing power and memory compared to the Sun. This performance improvement allows the server to support Virtual Machine operations, significantly reducing the total number of servers/workstations necessary. The VIDA Premier platform provides unified interoperable communications for voice, data and applications across a multitude of technologies ranging from LMR narrowband to broadband data networks. Because it supports the co-mingling of technologies to serve the diverse needs of all users operating on the system, the VIDA Premier platform is an integrated communications infrastructure that is scalable, flexible, and easily expanded.

1.1.1 Benefits of VIDA Premier Core

1.1.1.1 SR10A.1 Feature Highlights

- Consoles upgraded to Windows 7

- Network Sentry upgraded to Windows 7

- Enhanced BeOn feature set versus BeOn over ISSI

- Enhanced ISSI feature set

- Virtualized servers reduces hardware maintenance and complexity

1.1.1.2 Tiered COTS-Based Platform

The VIDA core is truly a commercial-off-the-shelf (COTS) equipment based platform. Harris has teamed with information technology industry leaders to develop a solution which draws upon next generation IT technology and overlays integrated critical communication services to provide the most robust, secure and redundant platform in the LMR market. No proprietary hardware or operating systems are embedded in the VIDA core.

Figure 1. IT Partners

Title	Description
Dell	NetApp
Cisco	Sybase
Red Hat	LogLogic

| Title	Description
Microsoft	SourceFire

The County currently has LogLogic and Unitrends servers that can be redeployed with the SR10A.1 system. Moreover, the County can leverage the existing Cisco firewalls and Alcatel 7705 Routers in the upgrade. Leveraging existing assets instead of simply replacing them is a Harris upgrade advantage.

1.1.1.3 Virtualized Core

The VIDA solution incorporates the use of virtual machines in the server core. Virtual machines are virtualized servers that support multiple applications, which would typically reside on their own individual servers (Figure 2). The virtualized servers automatically allocate the appropriate processing, memory and networking resources for each application. The virtualized servers within the VIDA core perform all of the mission critical services required, while reducing hardware, increasing efficiency, and making the most out of the resources for the network.

**Figure 2. Virtual machines reside on a single server.**
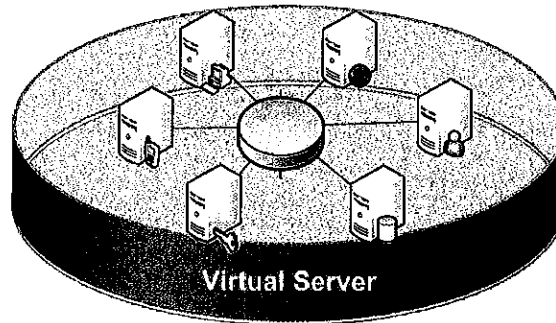
Virtualization has a number of benefits that serve to reduce total cost of ownership in terms of physical space required for the deployment and the cooling associated with having multiple servers. For a typical deployment, Harris' fully virtualized core will produce 25% of the heat and occupy 25% of the space as compared to traditional server architectures like the County's PR9C architecture.

Virtual servers provide the flexibility and control to manage resources more effectively, reduce costly down time, and provide that extra level of system resilience with key services to keep mission critical users operational. Additionally, a virtual server environment has a number of IT-centric benefits that fully support operations expected in an IT environment, including server redundancy, services monitoring, backup/restore capability and installation/upgrade processes.

1.1.1.4 Core Resiliency

A key to the successful operation of any mission critical network lies in maintaining the highest levels of network availability. Harris offers its VIDA solution in an array of redundant configurations to combat manmade and natural disasters. These high-availability options improve network redundancy and reliability across multiple local and geographically-separated locations, and they are cost-effective solutions for networks of any size. Because the County's current P9C configuration is a geographically-separated, Harris will upgrade to SR10A.1 using a geographically-separate core to maintain the highest level of resiliency.

Figure 3. VIDA offers high-availability redundancy.
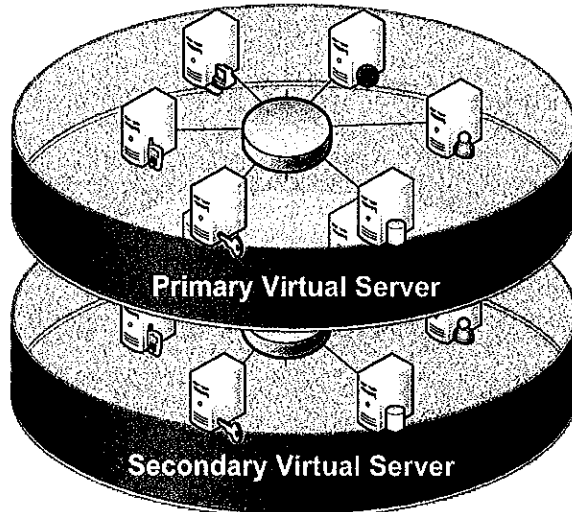
The VIDA solution provides full service high availability failover. Regardless of the services on the primary core, the secondary core takes over all services in failover (Figure 3). VIDA provides robust performance without compromise; failover does not mean failure.

VIDA networks employ the means to meet mission critical reliability, availability, and maintainability requirements, utilizing centralized services that can include geographically split redundant servers. Redundant servers, operating at distinctly separate geographically and judiciously separated locations (yet fully network interconnected), will provide automatic failover capability if a network switch becomes dysfunctional because a server, network, or physical location no longer functions. The High-Availability service on the VIDA core ensures expeditious failover of call routing, ensuring that communications continue with minimal impact to users.

1.1.1.5 Enhanced Feature Set

Two applications that are new to the County with SR10A.1 are the transcoder and BeOn Premier server.

1.1.1.5.1 VIDA Transcoder

Digital radio systems use a vocoder (or voice encoder) to convert analog voice signals to digital packets when someone speaks into a microphone. Conversely, the vocoder converts the digital signals that travel throughout the radio system to analog signals to reproduce human speech through the speaker. The vocoder rate defines the number of samples of the analog signal that are taken. Therefore, as the vocoder rate increases, the digital signal becomes a more accurate representation of the analog signal. The trade-off is that high-bit vocoders can consume a lot of bandwidth. Therefore, LMR protocols use various types of efficient (lower bit rate) vocoders. For example:

- P25 Phase 1 systems initially used the IMBE full rate vocoder

- Current P25 Phase 1 systems use the AMBE+2 full rate vocoder

- P25 Phase 2 systems use the AMBE+2 half rate vocoder

- Analog systems use the ADPCM vocoder

On other networks, if a radio using one type of digital protocol (or vocoder) wants to communicate with another radio using a different digital protocol, the call must undergo a digital to analog to digital conversion. These multiple conversions with low bit rate vocoders result in degraded audio quality.

By contrast, Harris' solution includes a transcoder, which makes use of parametric conversion algorithms. In other words, digital signals are translated from one format to another in the digital domain, without having to be decoded to analog signal. Specifically, the transcoder maintains data transfers over the VIDA network in their original formats. Different protocol sites operating on the same network switch always transmit and receive IP packets in their native network and over-the-air formats. All calls on the VIDA network carry a tag identifying its native vocoder. When the County needs to route a call to a site requiring a vocoder different from the tag embedded in the call, it routes the call to the VIDA Transcoder. The transcoder then converts the vocoder signaling from one format to the other and sends it to the end device in its native vocoder format. Unlike other systems where the voice converts from digital to analog and then back to digital, the transcoder translates the digital formats, thus and preserving audio quality.

The transcoder also plays a large role in Enhanced Dynamic Dual Mode, which allows Harris P25 systems to simultaneously support Phase 1 and Phase 2 conversations in the most efficient manner possible.

1.1.1.5.2 BeOn

The BeOn group communications suite extends P25 Land Mobile Radio (LMR) Push-to-Talk (PTT) communication services to users on commercial cellular and private LTE broadband networks. With the BeOn solution, voice communication services can be delivered to subscribers as Voice-over-IP data packets using wireless broadband IP data services. Using the BeOn solution, subscribers on a cellular broadband network have the ability to communicate amongst themselves or with interconnected LMR users.

The BeOn solution goes beyond LMR functionality by providing integrated voice, messaging, and location functionality. BeOn subscribers can use the coverage and bandwidth capabilities of a commercial or private broadband data network for communications between team members. BeOn subscribers have the ability to interoperate with users on existing LMR systems, exchange text messages with other BeOn subscribers, dispatchers using the BeOn PC client, and pass real-time location and presence information between connected BeOn team members. Transmitted voice and text messages can then be communicated in real-time and also be available locally on the subscriber handset for later recall. When these communications are combined with integrated mapping and presence (subscriber status) information, BeOn users have the ability to determine the most efficient actions to take.

Because BeOn operates over both commercial cellular and LTE networks, utilizing these networks provides an additional level of interoperability with LMR narrowband communications. This extends the network coverage of a regional, statewide, or nationwide LMR network to the available coverage of global commercial cellular networks. BeOn subscribers operating on broadband networks have a cost effective approach to extend the reach of their LMR communication systems.

BeOn is an ideal application for administrators or other personnel who carry both a smart phone and radio. BeOn allows them to use just the smart phone to maintain communications with others in their talkgroup, even when traveling outside of the radio coverage area.

The BeOn Premier server supports up to 500 clients, and can be expanded through licensing upgrades to accommodate up to 5000 clients. Harris has included a total of 500 client licenses. Specific details are included in the Pricing Section of this document.

1.1.2 SR10A.1 System Design

1.1.2.1 VIDA Premier Core

The VIDA Premier uses the VIDA Application Server (VAS) to run multiple virtual machines including management and control applications. The VIDA Application Server (VAS) interfaces with a Storage Area Network (SAN) of hard drives. The VAS automatically allocates the appropriate processing, memory, and networking resources for each application. In a VIDA Enterprise system, the following network management applications are installed on the VAS.

- Network Switching Service – Supports voice and data call switching

- VIDA Transcoder

- Unified Administration System – Enables the radio system administrator to manage operational aspects of the system including configuring users; establishing their privileges, organization, and security.

- Regional Network Manager – Provides a consolidated point for viewing and monitoring the performance of a land mobile radio network.

- Regional SitePro Manager – Routes administrative information (users and groups) between the UAS and the site and routes activity data from the site to the RNM.

- Activity Warehouse – Report-generating program used to monitor various aspects of a radio network.

- Device Manager – Facilitates the loading of code updates and personalities to numerous devices throughout the VIDA network.

- Active Directory – Provides network authentication tools for total system protection within the VIDA network.

- McAfee® ePolicy Orchestrator – Centrally manages security for systems, networks, data, and compliance solutions.

- Security Update Management Service (SUMS) – Acquires, tests, packages, and distributes many patch policies directly for customers, removing considerable patch management overhead. This largely automated process provides a consistent, high-quality patch in a timely manner.

- Root Certificate Authority, including Subordinate Certificate Authority

- BeOn® Group Communications Services – VoIP-based Push-to-Talk communications system operating over public or private wireless networks.

- Harris Remote Service Automation – Provides secure remote monitoring and servicing of VIDA systems.

1.1.2.2 Switch Upgrades

Monterey will receive the VIDA Premier upgrade to the current system release (SR10A.1) and new software options. The County need not pay for Network Switching Center software applications or

licenses that transfer from the existing NSS. SR10A.1 is required to support optional Project P25 Phase 2 operations.

A rack-up of the existing VIDA PR9C core components is shown in Figure 4.

Figure 4. VIDA PR9C Core at 911 Center

NSC Cabinet 42 RU
(76.39"H x 23.62"W x 42.13"D)

BLANK PANEL
MPLS POWER SUPPLY - MAIN
MPLS POWER SUPPLY - BACKUP
CISCO ASA5505 IFW1
SPECTRACOM NETCLOCK 9389
CISCO ASA5510 RFW1
CISCO 3925 WAR1
ALCATEL-LUCENT 7705 MLS1 (REAR)
CISCO 3560 RAR1 (REAR)
KVM/LCD
BLANK PANEL
NETWORK SWITCHING SERVER (NSS)
BLANK PANEL
REGIONAL VIDA MANAGER (RVM)
BLANK PANEL
BLANK PANEL
ACTIVE DIRECTORY SERVER (ADS)
REGIONAL SITE MANAGER (RSM)
LOGLOGIC
BLANK PANEL
UNITRENDS
BLANK PANEL
SUMS 2
KEY MANAGEMENT FACILITY (KMF)

Comparatively, the SR10A.1 VIDA Premier Core is simpler due to its support of virtualization:

Figure 5. Primary SR10A.1 VIDA Premier Core
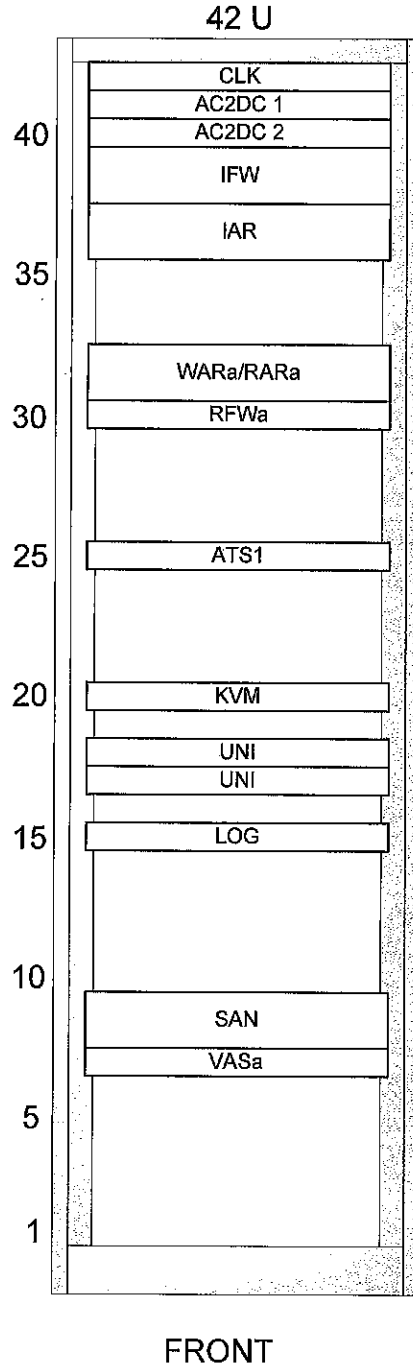
For the Primary NSC, Harris will:

- Provide and install a high-availability, VIDA Premier NSC running SR10A.1 software as the primary NSC at the 911 Center. The new NSC at the 911 Center will include new,

  - VIDA Application Server (VAS)

  - Storage Area Network (SAN)

  - Cisco 2921 Regional Access Router/WAN Aggregate Router

  - KVM

  - Automatic Transfer Switch

- Migrate Interoperability Gateways from the PR9C system to the SR10A.1 system.

- Reuse the following network components

  - Alcatel 7705 MPLS router

  - Cisco ASA5510 Regional Firewall

  - Cisco ASA5505 Internet Firewall

  - LogLogic Server

  - UniTrends Server

  - NetClock

- Connect the NSC to the County backhaul.

For the Secondary NSC, Harris will:

- Provide and install secondary VIDA Premier equipment running SR10A.1 software as the primary NSC with high-availability software, at Moffett Street. The new, secondary NSC will include new:

  - VIDA Application Server (VAS)

  - Storage Area Network (SAN)

  - Cisco 2921 Regional Access Router/WAN Aggregate Router

  - KVM

  - Automatic Transfer Switch

- Reuse the following network components:

  - Alcatel 7705 MPLS router

  - Cisco ASA5510 Regional Firewall

- Cisco ASA5505 Internet Firewall

- NetClock

- Connect the NSC to the County backhaul.

1.1.3 Backhaul

Harris will use the backhaul currently allocated for the PR9C system. No additional backhaul is necessary as part of the upgrade. As an option, Monterey may purchase a set of 16-port T-1 cards for the 7705 MPLS routers to provide redundant T1 connections between the Network Switching Centers. The redundant connections will provide enhanced reliability and system stability should one T-1 link fail. Harris can provide optional pricing upon request.

1.1.4 Training

The knowledge and skills of County personnel who will be responsible for operating and managing the P25 radio system must be developed due to the proposed upgrade to SR10A.1. Harris shall provide a three-day customized, instructor-led SR10A.1 training course that will cover the following topics:

- System Review focusing on changes due to SR10A.1 including the Premier Network Switching Center architecture

- New Unified Administration System (UAS) interface

- New Regional Network Manager (RNM) interface

This course will be conducted at a facility provided by County one (1) time on mutually agreeable days based on student, instructor and facility availability. Access to SR10A.1-based system equipment such as the UAS and RNM will be required. Maximum class size is ten (15) students.

Training shall be delivered by our technical training staff that is comprised of training professionals with extensive experience in both telecommunications and adult learning. Instructor certification ensures that each trainer possesses the instructional skills and technical competencies to deliver high-quality training. Instructors are assigned to conduct training based on their areas of expertise. However, Harris will provide the County with the opportunity to review and approve the instructor assigned to conduct training for the County.

1.1.5 SR10A.1 Implementation Plan

1.1.5.1 Design Reviews

1.1.5.1.1 Kickoff Meeting and Preliminary Design Review

The project manager will initiate the project with a Project Kick-off Meeting and a Preliminary Design Review. Harris and County will mutually agree upon the timing of these meetings. The meetings may coincide, if possible, to expedite the project. The objectives of the meeting will include:

- Introduction of all project participants

- Review of the roles of the project participants

- Review of the overall project scope and objectives

- Review of the current site status

- Review of the current frequency plan

- Review of the preliminary schedule

1.1.5.1.2 Prepare for the Detailed Design Review (DDR)

The project team will assemble the information obtained during the Kick-off Meeting and Preliminary Design Review along with the information derived from any necessary site surveys with the County. This information along with the design effort for the proposal will be crucial in developing the documentation for the Detailed Design Review (DDR).

1.1.5.1.3 Detailed Design Review (DDR)

The Harris team will present design drawings and documents and review the system design with the County at a mutually agreed upon time and location.

Figure 6. Design Reviews Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Kickoff Meeting and Preliminary Design Review			
Assemble project team and travel to County's location	X		
Present preliminary information on design	X		
Provide a team and propose a schedule for site surveys	X		As necessary
Arrange access to sites and confirm site survey schedule		X	As necessary
Assemble customer team for Kick-off Meeting		X	
Provide location in appropriate conference room or training facility		X	
Provide site-knowledgeable person to accompany the project team on site surveys		X	As necessary
Conduct site surveys	X	X	As necessary
Prepare for Detailed Design Review			
Provide site plans and applicable electrical and layout plans	X		
Perform grounding analyses	X		As necessary
Develop required drawings	X		
Develop network plans	X	X	
Develop site electrical loads	X		
Develop preliminary cutover plan	X		
Develop formal project schedule	X		
Prepare ATP documents	X		
Provide answers to Harris questions		X	

Tasks	Harris	County of Monterey	Comments
Detailed Design Review			
System block diagrams	X		
List of deliverable equipment for each site	X		
Network connection plan	X		
Shelter floor plan drawings	X		
Rack elevation drawings	X		
AC power and BTU loads	X		
Review preliminary cutover plan	X		
Review ATP	X		
Project schedule	X		
Provide appropriate personnel to review documents		X	
Provide location for DDR meeting		X	
Approve the design following DDR meeting		X	5 days

1.1.5.2 Manufacturing and Staging

After final design approval, the project team will procure material and schedule manufacturing using its Enterprise Resource Planning system. The factory will receive orders to manufacture the network equipment. In addition, vendor/subcontractor items will be ordered. Factory specifications will define the test for each individual rack of equipment.

After manufacturing and testing, system engineers will assemble the equipment in the factory staging facility. The system engineers will work with staging technicians to make all intra-rack connections.

At the end of staging, the equipment will be prepared for delivery to the County. Wrapping each NSC rack in clear plastic wrap and properly securing it ensures safe transportation. Typically, Harris arranges to ship equipment and materials to a Harris-provided storage area near the point of installation. At the storage area, the equipment is inventoried and the material is collected for delivery to the installation sites.

Figure 7. Manufacturing and Staging Responsibility Matrix

Tasks	Harris	Monterey	Comments
Insert equipment delivery dates into the enterprise resource planning system	X		
Place orders with the factory	X		
Place orders with key suppliers	X		
Place orders for vendor items	X		

Tasks	Harris	Monterey	Comments
Manufacture all infrastructure equipment	X		
Assemble equipment in staging area on a per site basis	X		
Break down equipment and ship to storage area	X		
Provide temporary storage near County's location	X		
Inventory equipment	X		
Validate Harris equipment inventory	X	X	
Collect all equipment on a per site basis, ready for the installation teams.	X		

1.1.5.3 System Installation

The installation plans will be developed during the detailed design phase of the project and presented to County for review and approval. Based on site surveys conducted by Harris personnel or its subcontractors, the installation plans will include floor plan drawings, equipment rack-up drawings, grounding standards, as well as installation and commissioning procedures. The installation plan will coordinate all activities of the project team, minimizing conflicts and ensuring that system implementation proceeds efficiently.

The installation team will install the new equipment at the locations disclosed in the system design and integrate the proposed subsystems per the DDR.

1.1.5.3.1 Infrastructure Equipment

Because the County will re-use existing site equipment, it must have existing conduits, cable trays, AC power feeds, and other equipment that are properly grounded. Equipment that is not installed will be upgraded in the warehouse/storage facility. The NSCs will be mounted in standard 19-inch server cabinets similar to the PR9C NSC racks. Harris assumes that County sites will provide the desired 36 inches of free aisle space (in front and in the rear) for ease of maintenance.

After updating the core NSC equipment, Harris will visit the installed, 700 MHz sites and perform software updates of the site equipment toSR10A.1 as necessary. The base stations and site equipment can continue operate with PR9C code on the SR10A.1 core as multi-sites until Harris can visit and update each site.

Figure 8. System Installation Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Upgrade C3 Maestro^{IP} Consoles to current software revision	X		
Upgrade existing P25 sites to current software revision	X		
Upgrade NSC Core Equipment with current hardware	X		
Provide NSC Core Equipment with current software	X		

1.1.5.4 System Optimization

Upon upgrade of the NSC and infrastructure equipment, the system engineer(s) will work with the on-site technicians to optimize the equipment as necessary in preparation for acceptance testing of the NSC and new site-equipment software.

Figure 9. System Optimization Matrix

Tasks	Harris	County of Monterey	Comments
Prepare all sites for site inspections	X		
Verify backhaul system is functional and meets reliability specifications	X		
Verify system database is installed and operating correctly	X		
Verify proper network switching operation	X		

1.1.6 Site Responsibility Matrix

The Site Responsibility Matrix:

- Describes the general project responsibilities of both parties to perform that are not associated with any specific site

- Summarizes the site facilities

- Defines the specific site development and equipment installation activities Harris has proposed

- Defines the responsibilities of all parties for the implementation of the technology evaluation project for each site or location

1.1.6.1 General Requirements

Figure 10 describes the general project responsibilities of both parties to perform which are not specifically associated with any specific site.

Figure 10. General Requirements Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Designate a Harris project manager	X		
Designate a County project manager		X	
Manage the Harris project team	X		
Establish project communications protocol and maintain communications log as required	X		
Conduct internal weekly project review meetings and submit weekly status reports	X		
Conduct weekly project update calls	X		
Participate in weekly or bi-weekly project update calls		X	
Report project progress as compared to project schedule	X		
Update project schedule weekly	X		
Manage and control the flow of products and equipment from the factory to meet the project schedule	X		
Review change orders with Harris project manager and provide approval		X	
Monitor and manage risks using the Harris Risk Management Plan	X		
Review and approve submitted design documents within two weeks or respond with revisions		X	
Provide written approval for major milestones such as DDR, staging, ATP, and final acceptance		X	
Provide timely responses to issues and questions		X	

Tasks	Harris	County of Monterey	Comments
Coordinate with federal, state, and local government agencies, as required		X	
Designate system administrators		X	
Provide access to all buildings and sites, including temporary ID badges for Harris project team		X	
Provide parking permits for Harris 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 debris and unwanted material from the installation activity	X		
Remove any hazardous material found on site		X	As necessary
Re-use project backhaul meeting the following specifications: - Physical interfaces will be copper Ethernet at either 100Mbps/full duplex no-negotiation or 1Gbps/full duplex - Multi-Site Latency – Latency within the system will need to stay constant to avoid jitter. For standard implementations, latency should be less than 150 msec. - Multi-Site Jitter – Overall jitter will average 0 and never build up to more than 60 msec. Streams with excessive jitter will result in packet loss and Harris will not be responsible for voice quality issues.	X		County responsible to correct backhaul deficiencies per Contract

1.1.6.2 Fixed Equipment Installation

Harris will be responsible for the installation of all fixed equipment contained in the following detailed description of work as approved in the DDR. Installation will be scheduled in conjunction with the delivery of equipment after staging and completion of site development work required at each site. Installation of all equipment will be done in a neat and professional manner, employing a standard of workmanship consistent with Harris' installation standards and in compliance with applicable NEC, EIA, FAA, and FCC standards and regulations.

Figure 11 lists the systems to be installed as part of the SOW:

Figure 11. Major System Components

Site Name	Site Purpose
Primary NSC Location	Primary NSC

Site Name	Site Purpose
Secondary NSC Location	Secondary NSC

1.1.6.3 Site Details

This section summarizes the site facilities and defines the specific site development and equipment installations that Harris has proposed and will perform.

Figure 12. System Installation Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Install SR10A.1 VIDA Premier NSCs	X		

Figure 13. Site Development Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Provide existing site plans		X	As necessary
Upgrade existing interior ground system		X	As necessary
Provide floor space at the network centers for new system equipment		X	
Provide backup power (UPS) for NSCs		X	

1.1.6.4 Deliverables

Harris will deliver the following items to the County as part of the final documentation:

1.1.6.4.1 Equipment

Item	Qty
VIDA Premier Network Switching Center – 911 Center Primary with Geo-Separated HA Config	1
VIDA Premier Network Switching Center – Moffett St. Secondary with Geo-Separated HA Config	1

1.1.6.5 Documents

- System block diagrams
- List of deliverable equipment for each site
- Network connection plan
- Shelter or equipment room floor plan drawings (including rack elevation drawings
- Power and BTU loads
- Project schedule
- Acceptance Test Procedures

- Functional verification of NSC
- As-built drawings

1.2 Symphony Dispatch Consoles

Harris shall replace the existing 25 C3 Maestro IP consoles with a special promotional and trade-in upgrade to the Next-Gen Symphony dispatch consoles with AES encryption.

The Symphony dispatch consoles are full-featured dispatch consoles with true IP secure network connectivity. The Symphony console is Harris' latest offering in IP dispatch technology based on the Microsoft Windows operating system. The screen layout is easy to learn and operate; maximizing productivity while minimizing training time. Large buttons and intuitive, customized layouts make maneuvering through the console functions easy and straightforward.

Harris dispatch systems are supportive of and can operate in a method fully consistent with the NFPA 1221 standards. The Symphony also incorporates both the workstation and audio functions into a compact, single rack-unit design. Telephone audio from 911 dispatch phone systems or business phone systems can be connected to the Symphony via 4-wire POTS lines with an off-hook indication. This connection allows the dispatchers to select the audio source for their headset to manage 911 and administration phone calls while dispatching the radio system.

These consoles are independent of one another. Hence, failure of one console does not affect operations of the other consoles.

The promotional upgrade will allow Monterey County to initially run the C3 Maestro software on the Symphony dispatch hardware. Harris is responsible for the initial install of the C3 Maestro software on the Symphony hardware. The Symphony dispatch hardware shall perform in accordance with the Agreement when running C3 software. Once all the features in the Symphony dispatch consoles are available to support the Monterey requirements, the county can switch over to running the Symphony software on the Symphony hardware. At the time of transitioning to the full Symphony platform, price and scope for installation services, configuration and training will be quoted by Harris to Monterey County

For the County, the trade in Symphony hardware includes the following:

- SDP (Symphony Dispatch Platform)
- Speaker cables
- Single USB footswitch
- Display port to VGA, cable adapter

For the County, the trade in Symphony software includes the following:

- SDP (Symphony Dispatch Platform)
- Local full screen and Local Baton
- I call

- Call Dir
- 5 Patches
- 4 simulselects
- 4 speaker licenses
- 10 user setups
- 16 workspace tabs

In addition, Harris has also configured each Symphony console with the additional feature licenses per console:

- **Conventional Channel** – Conventional channel provides the control of conventional base stations.
- **Paging** – An on-screen encoder or an external encoder are included for paging.
- **Aux I/O** – Up to six optocoupler auxiliary inputs and up to five outputs are included.

The Symphony Dispatch Platform is highly configurable to match dispatcher needs. A vibration-hardened enclosure contains both the embedded computer and audio processor.

Highlights of the Symphony Dispatch Platform include:

- Scalability for easy upgrades
- Flexible and simple mechanical configuration (mount in a rack, mount under a desk, or use as a desktop unit)
- Vibration resistant
- Remote configuration capability
- End-to-end voice encryption for secure communications
- Superior life-cycle management
- Support for trunked and conventional operation
- Ability to run the existing C3 MaestroIP application or the Symphony application
- Silent operation with no moving components

Equipment List for the special promotional and trade-in upgrade:

Part Number	Description	Qty
UD-ZN2F	CONSOLE,MIP TO SYMPHONY HW/SW,	25
UD-SG4W	LICENSE,AES LEVEL ENCRYPTION	25
UD-SG4T	LICENSE,CONVENTIONAL CONTROLS	25
UD-SG4U	LICENSE,PAGING CAPABILITY	25
UD-SG4Y	LICENSE,REMOTE AUX I/O	25

Part Number	Description	Qty
UD-ZN2F	CONSOLE,MIP TO SYMPHONY HW/SW,	25

Maestro IP vs Symphony Feature Chart:

| Item	Category	Original C3 Maestro on Dell with MAUDIO (reference Exhibit A_3)	Symphony HW running C3 Maestro IP (Difference from original C3)	Symphony running Symphony SW (Upgrade)	Symphony Feature Roadmap (Release)	Notes/Explanation
1	License	IMBE P25 Vocoder	same	same	R1	
2	License	AES Encryption	same	same	R2	
3	License	C3 Maestro IP Default Select Entity	same	same (new License)	R1	
4	License	C3 Maestro IP Enhanced Aux. IO	same	same (new License)	R2	Equivalent functionality in Symphony (improved GUI)
5	License	C3 Maestro IP Enhanced RTT	same	(new License) RTT (Part1)	R5	RTT (Part1)
6	License	C3 Maestro IP Int. Stack Paging	same	(new license) paging	R2	Equivalent functionality in Symphony (improved GUI)
7	License	C3 Maestro IP Module Status	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
8	License	C3 Maestro IP Pat .SS Mirror	same	same (new License)	D*	Upgrade limited to 6 patched, 4 simulselects
9	License	C3 Maestro IP Priority Group	same	(new License)	R1	Equivalent functionality in Symphony (improved GUI)
10	License	C3 Maestro IP RTT	same	(new License) RTT (Part1)	R5	RTT (Part1)
11	License	C3 Maestro IP Silent Emergency	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
12	License	C3 Maestro IP Status Message	same	Implemented in base package	D*	Equivalent functionality in Symphony (improved GUI)
13	License	C3 Maestro IP Tracking Modules	same	Implemented in base package	D*	Equivalent functionality in Symphony (improved GUI)
14	License	C3 Maestro IP Unkey Beep	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
15	Feature	Communication Modules	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
16	Feature	Message Panel	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
17	Feature	ICALL Panel	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
18	Feature	Status Panel	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
19	Feature	Volume Meter	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
20	Feature	Clock Panel	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
21	Feature	Page Button	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
22	Feature	Command Panels	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
23	Feature	Call History	Same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
24	Feature	Customized Personality (UDS)	same	Implemented in base package	R1	Symphony can be customized on the fly (there is no longer a separate application for setups User Defined Screens(UDS)
25	Feature	Patch	same	Implemented in base package	R1	Equivalent functionality in Symphony (Improved GUI)
26	Feature	Simulselect	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
27	Feature	Supervisor Mode	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
28	Feature	Cross Mute	same	Implemented in base package	R1	Symphony to Symphony (not Symphony to C3 - different implementation)
29	Feature	Encryption	same	Implemented in base package	R2	Equivalent functionality in Symphony (improved GUI)
30	Feature	Alert Tones	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
31	Feature	Cross Mute	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
32	Feature	Cross Mute	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
33	Feature	Emergency Calls	same	Implemented in base package	R1	Equivalent functionality in Symphony (improved GUI)
35	Hardware	Dell Processor / MAUDIO card	Intel/Harris Audio Processor	same		
36	Hardware	Windows 7	Windows 7	Windows 8	R1	Symphony uses Window 8
37	Hardware	Mouse	same	same		
38	Hardware	Keyboard	same	same		
39	Hardware	Footswitch discrete input	Footswitch usb input	Footswitch usb input		Original not yet purchased - will be purchased for Symphony HW
40	Hardware	Desk Mike	same	same		same - in market
41	Hardware	Headset Jack (no headset)	same	same		Original Not yet purchased
42	Hardware	Select/Unselect Speaker	same	same		Not yet purchase (Quantity 20 with 2 speakers and Quantity 5 with 4 speakers)
43	Hardware	24-Inch Widescreen LCD Monitor (non-touch)	Use Symphony Monitor	Use Symphony Monitor		Not purchased (may use 24 in. LCD credit to buy 21 in. HD monitors compatible with Symphony)

*D=Done Differently in Symphony, but same functionality as C3

1.2.1 Baton Feature

The Baton is a distinctive characteristic that sets the Symphony console apart from other consoles. The Symphony Baton feature is a set of 2-3 distinct offerings:

1. Local Baton

   Included as a standard feature in the Symphony media kit and trade-in program for Monterey County. The Local Baton is included in this Amendment #3.

2. Remote Baton

   Enables the Baton to run on a remote machine, such as the machine running CAD. The Remote Baton is a separate option for purchase and is not included in this Amendment #3.

3. Remote Baton with interface and integration with another program like Computer Aided Dispatch (CAD). This feature is also a separate option for purchase and not included in this Amendment #3. Quotes for the Remote Baton, CAD API or SDK can be provided upon request. Pricing varies and is done on a case-by-case basis, based on the scope of services required to implement the interfaces and integration.

The image below is an example of the Baton display.
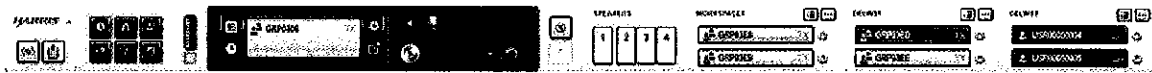
Local Baton

The Local Baton can be operated as an alternative to the Full Screen console. It essentially provides an alternate condensed console UI for Symphony. The Local Baton operates on the Harris Symphony Console Screen only.

Remote Baton

The Remote Baton is designed to preserve screen space on <u>other</u> computer screens such as a CAD screen. Most functions, such as interacting with the Select entity of the console, are exposed in a space efficient area on the screen and may be operated from the same mouse and keyboard as the CAD UI.
The efficiency of the Baton display means that the Baton can reside at the bottom of a CAD monitor. The Baton supports mini modules only; however the modules can be popped-out from the context menu to make them normal sized, moveable modules.

The screen shot below shows the Symphony Baton being used on a CAD screen.
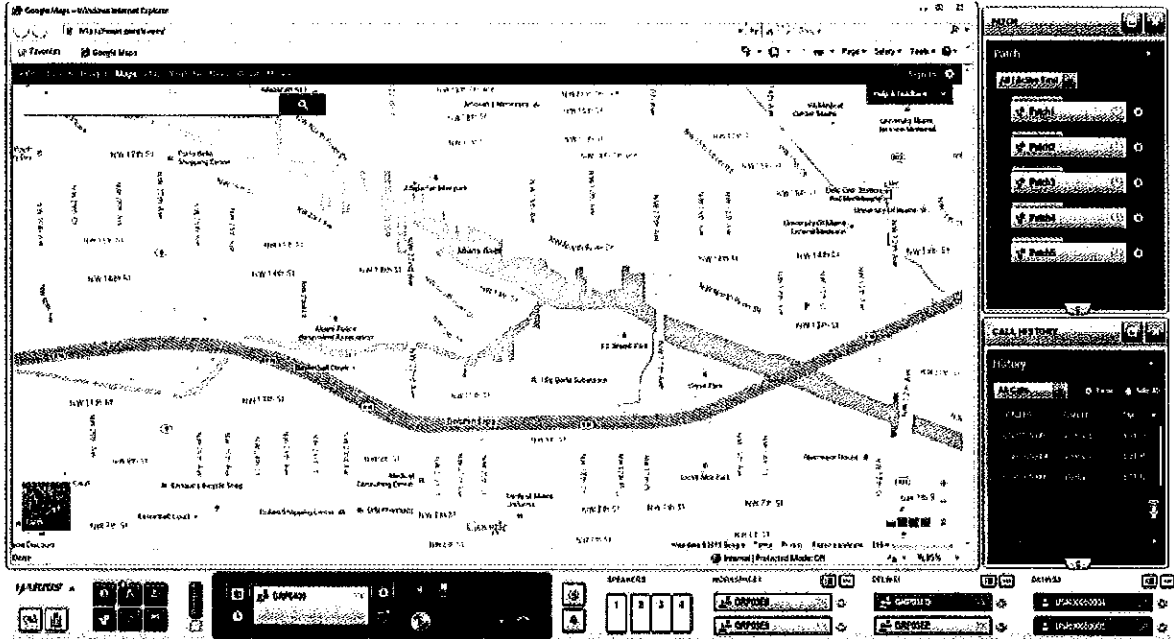
The table below shows the capability differences between local and remote baton feature sets:

CAD API

The CAD API allows for a CAD company to build voice dispatch features directly into the CAD UI. This requires that the CAD Company develop SW to interface into the Symphony API and UI features within their CAD UI

Figure 14. Symphony Baton Capabilities feature comparisons

Capability	Local Baton	Remote Baton	Remote Baton and SDK
Appear and run on Symphony Console Desktop and Screen.	Yes	Not applicable	Not applicable
Appear on another desktop screen but ONLY operate with Symphony desktop and Symphony application.	No	Yes	Yes
Allow 3rd party applications to talk to Symphony and allow Symphony to talk to the same 3rd party applications thru API	No	No	Yes
Appear on another desktop screen AND Interoperate with that desktop's application (ex. CAD)	No	No	Yes
Included in Monterey C3 Maestro Upgrade Bundle	Yes	No	No
Pricing	Included with Symphony	Additional cost.	Additional cost. Product and

Capability	Local Baton	Remote Baton	Remote Baton and SDK
		Per seat (console position) licenses and services based on scope and training requirements.	services costs developed with customers on a case-by-case basis based on the 3rd Party Applications, Interface and Integration requirements.

1.3 REA 21 Description

This section describes Harris' technical solution to REA 21.

1.3.1 Site Locations

1.3.1.1 VHF IP Simulcast System

A VHF IP Simulcast system will consist of 5 Sites – 7 Channels P25 Phase I configured for the areas listed below and shown in Figure 15.

1) 911 Dispatch Center
2) Marina Coast Water Tower (MCW)
3) Pebble Beach Corp. Yard (PBCY)
4) Laguna Seca
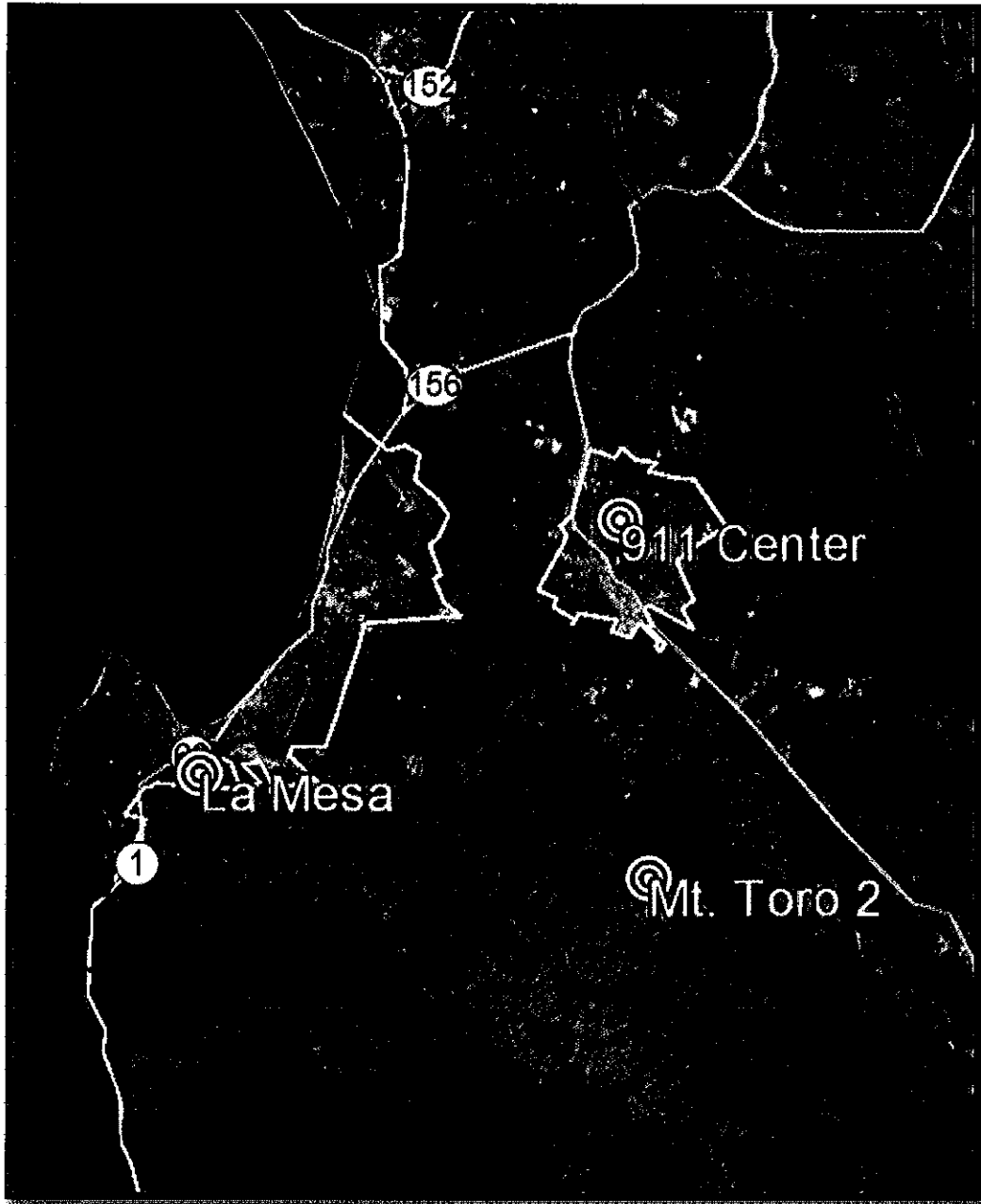5) Penon Peak

Figure 15. VHF 5 Site IP Simulcast System
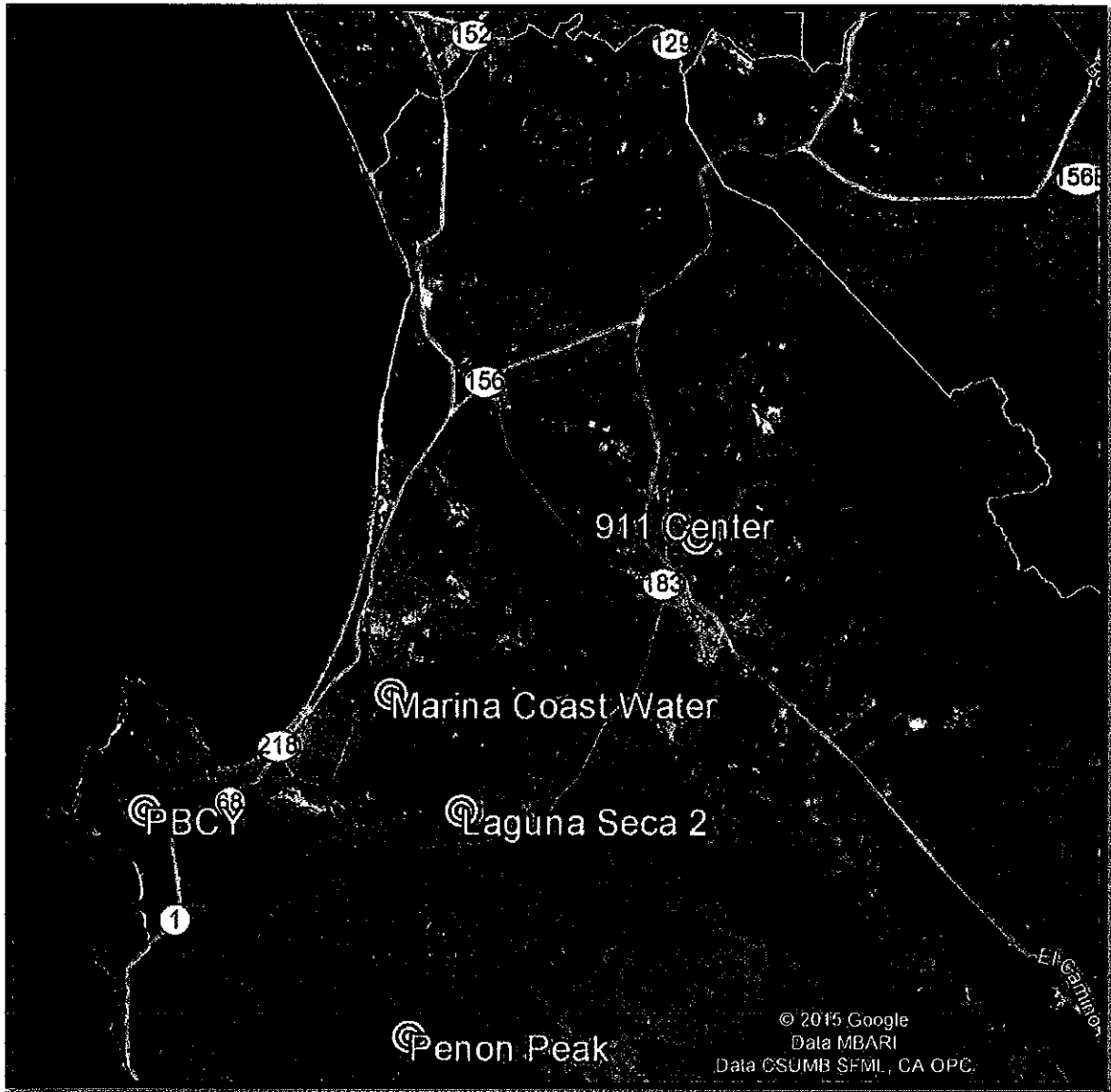
1.3.1.2 700MHz IP Simulcast

The 700 MHz IP simulcast system will include 3 Sites – 8 channels P25 Phase I configured for the areas listed below and shown in Figure 16.

1) 911 Dispatch Center
2) Mt. Toro
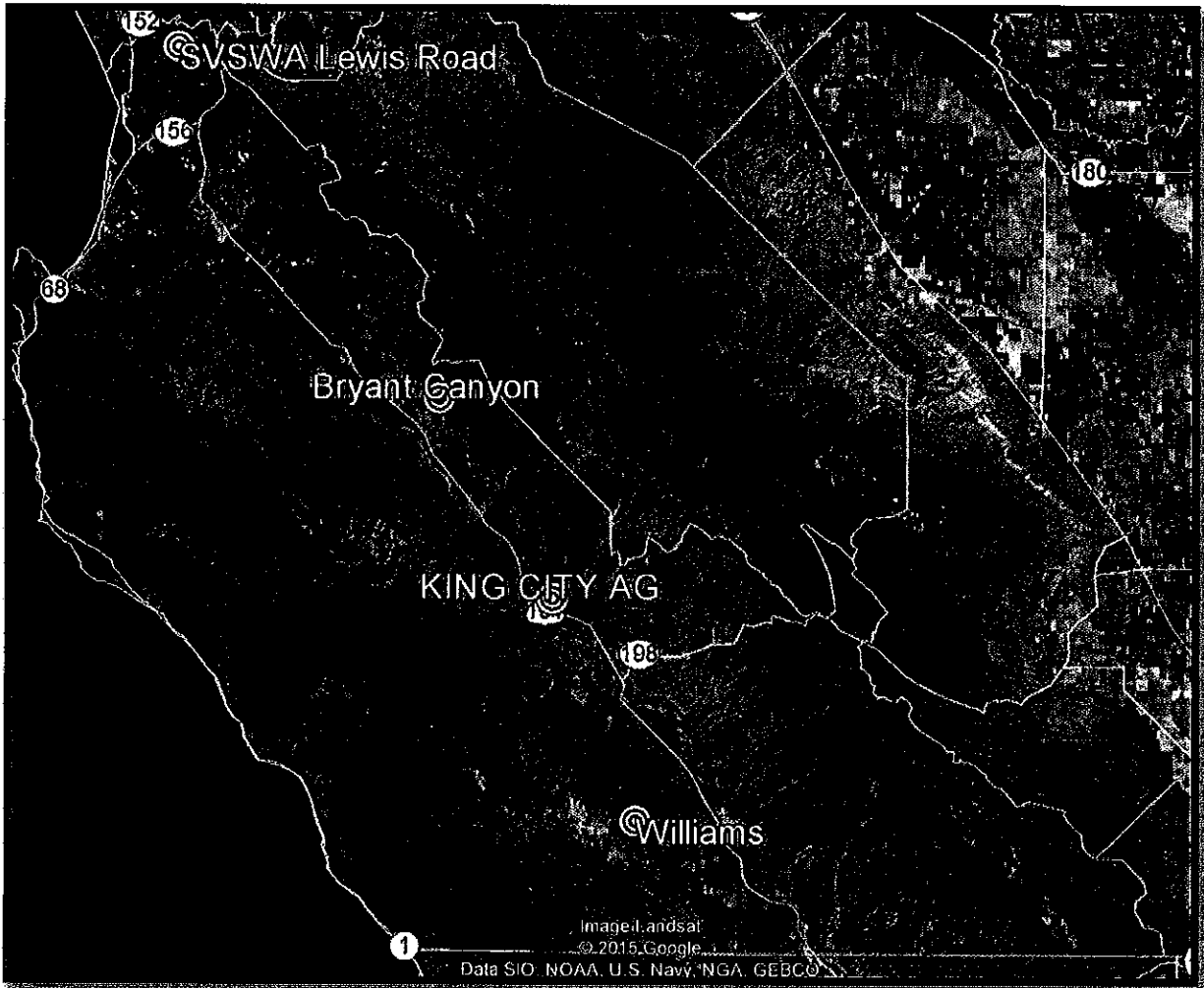3) La Mesa

Figure 16. 3 Site - 700MHz IP Simulcast System

1.3.1.3 Multicast Sites

Multicast sites will include 4 Sites as follows:

1) Lewis Road Landfill - VHF
2) Bryant Canyon - VHF
3) King City AG - VHF
4) Williams Hill – 700 MHz

Figure 17. Multicast Site locations

1.3.2 System Coverage

Coverage for REA 21 is based on a composite bounded area design consisting of a 5 Site VHF IP Simulcast system, 3 VHF Multicast Sites, and 1 700 Multicast site. The 700 MHz IP Simulcast system is not considered in the bounded area coverage since it is not intended to cover the entire bounded area and was not included in the original guarantee. Coverage is also predicated on the

availability of VHF Channels. The system coverage is defined by the four (4) bounded areas as follows in Table 1:

Table 1 - Monterey County Coverage Boundary Key

Boundary	Color / Line Style
Trunked Mobile Area Outdoor	
Trunked Portable Area	
Peninsula Area	
Salinas Area	

Coverage Color Code	Color
Non Covered Areas	
Areas Greater than -104 dB (Coverage)	
*Non Coverage Due to Delay Spread (> 60us)	

* - P25 Phase II Delay Spread Timing Requirement

The Requirements for each bounded area are shown in Table 2 and Figure 18 below:
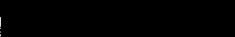
Table 2 - Monterey County Coverage Boundaries

Bounded Coverage Area Tiles	1 Mile Grids	1/4 Mile Grids
Trunked Mobile Area Outdoor	1479	
Trunked Portable Area	926	
Peninsula Area Mobile Outdoor / Portable Indoor		938
Salinas Area Mobile Outdoor / Portable Indoor		358

	Coverage Requirement	Harris Guarantee
Trunked Mobile Boundary Countywide		
MTO	95	95
Trunked Portable Boundary Countywide		
PTO	95	95
Peninsula Area Boundary Urban		
MTO	97	97
PTO 6 dB	95	95
Salinas Area Boundary Urban		
MTO	97	97

PTO 6 dB	95	95
PTO 12 dB	95	95

Figure 18. Monterey County Boundaries
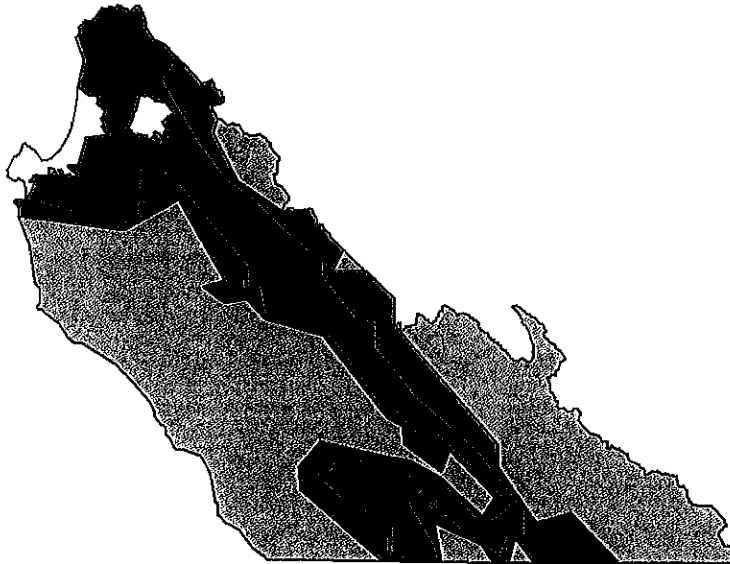
The coverage plots presented in this statement of work are partial screen shots for reference only. Complete Harris approved plots will be submitted to MC as part of the REA 21 final documentation package.

1.3.2.1 Mobile Talkout – Countywide Mobile Boundary

Figure 19. Countywide Mobile Talkout – 5 Site VHF IP Simulcast 4 Multicast Sites
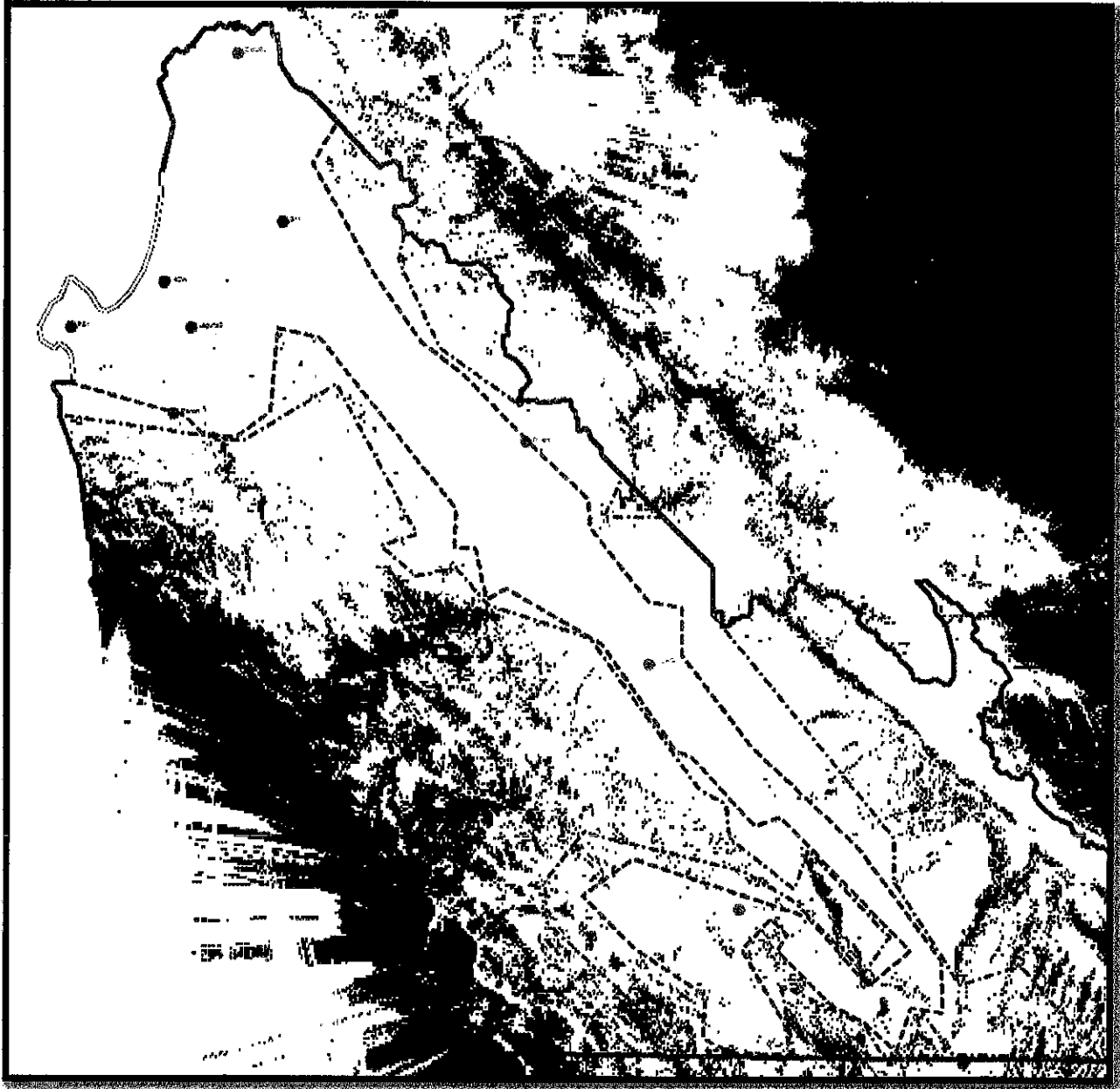
1.3.2.2 Portable Talkout On Street – Countywide Portable Boundary

Figure 20. Countywide Portable Talkout On Street – 5 Site VHF IP Simulcast 4 Site Multicast
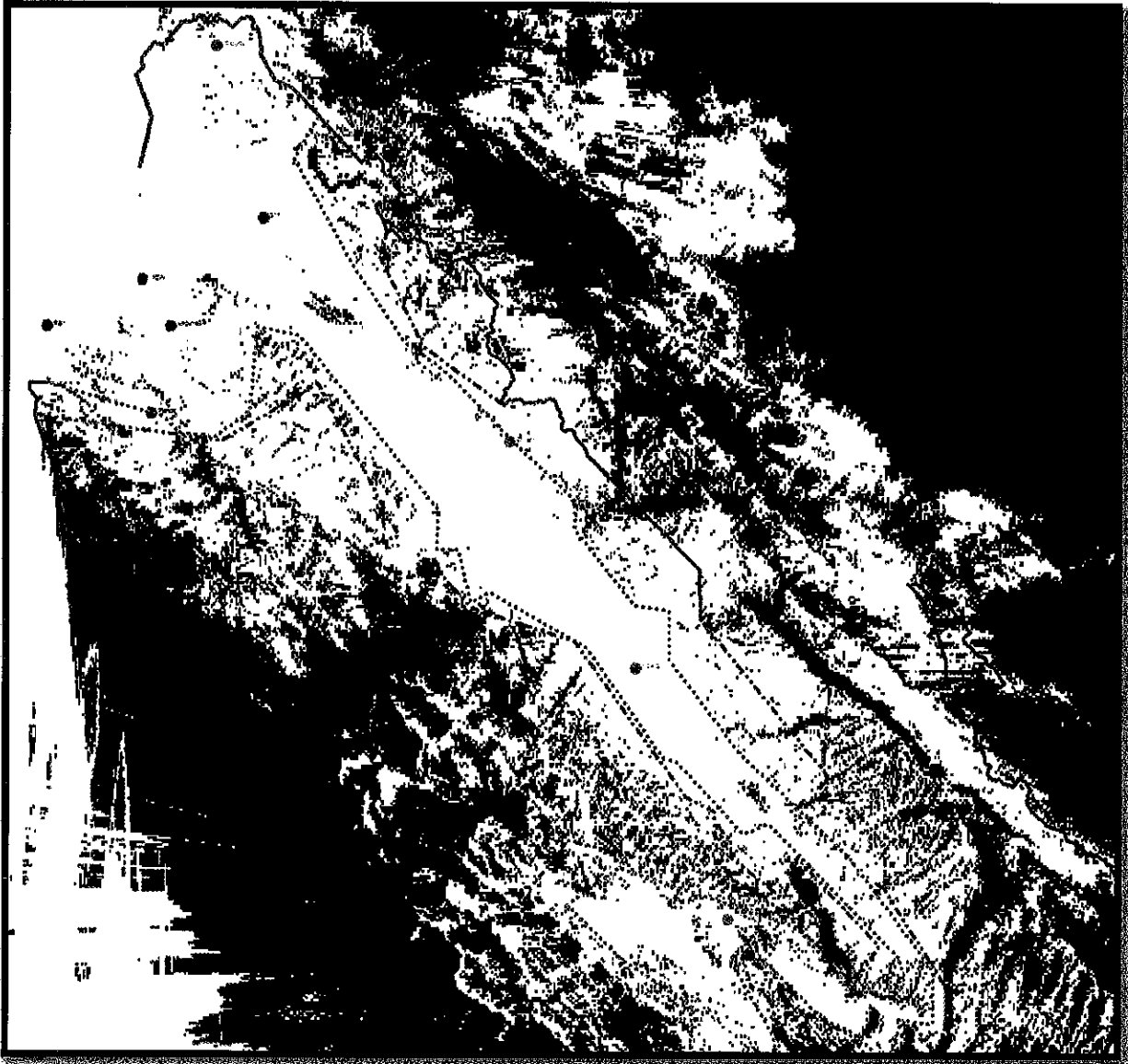
1.3.2.3 Portable Talkout 6 dB Buildings - Salinas and Peninsula Boundaries

Figure 21. Salinas and Monterey Peninsula - Portable Talkout 6dB Buildings – 5 Site VHF IP Simulcast 4 Site Multicast

1.3.2.4 Portable Talkout 12 dB Buildings - Salinas Boundary

Figure 22. Salinas - Portable Talkout 12 dB Buildings - 5 Site VHF IP Simulcast 4 Site Multicast Salinas

1.3.3 Traffic Analysis

The REA21 design includes a reassessment of the traffic analysis from the originally projected 11 channel VHF simulcast system. Monterey County (MC) has had difficulty obtaining 11 channel pairs for use in the trunked VHF Simulcast system. The system has been re-analyzed to determine the traffic loading impact by reducing the number of VHF channel pairs to 7, but adding a second simulcast system (700MHz P25) that would distribute the traffic load between the two systems.

1.3.3.1 REA 21 Traffic Analysis Inputs

A number of inputs are required for REA 21 in order to meet the needs of the County's System. The inputs are as follows:

1) Exhibit A – Statement of Work; Voice Infrastructure Statement of Work; Sections:
   a. Capacity Analysis (page 22)
   b. Traffic Model (page 23)
2) Split Traffic Loading between 700 Band and VHF
3) 5 - Site VHF IP Simulcast Site with 7 Channels
   a. PBCY, MCW, 911, Penon Peak, Laguna Seca, Lewis Road
4) 3 - Site 700 MHz IP Simulcast with 8 Channels
   a. Mt Toro, 911 Center, LaMesa
5) 3 - VHF Multicast Sites
   a. Lewis Road Landfill, Bryant Canyon, King City
6) 1 - 700MHz Multicast Site
   a. Williams Hill
7) Realize the ability to use 700 Multicast sites for a simulcast cell using Distributed Control Point
8) Multiband Radios use 700 Simulcast as preferred system.
9) VHF Single band radios use VHF Simulcast as preferred system
10) Original VHF Simulcast System is limited to seven (7) channels due to ability to license the original eleven (11) VHF pairs required for the trunked system.
11) The VHF seven (7) channel Simulcast System traffic load will be reduced from handling 84% of public safety users to 32%.
12) The 700MHz Simulcast System will be introduced to supplement the reduction of VHF channels and capable of a traffic load of 52% to total 84% in combination with the VHF Simulcast system. Figure 23shows the distribution among systems.

Figure 23. Traffic Load Analysis

User Profile Types	User Group	System 1 VHF SC Phase_1 % of User Group Using P1	System 2 700M SC Phase_1 % of User Group Using P1	System 3 VHF LRL Phase_1 % of User Group Using P1	System 4 VHF BC Phase_1 % of User Group Using P1	System 5 VHF KC Phase_1 % of User Group Using P1	System 6 700M WH Phase_1 % of User Group Using P1
1	Public Safety	32%	52%	7%	3%	3%	3%

13) Defined User Profile are provide in Figure 24 below:

Figure 24. Public Safety User Profile

User Profile Types	User Group	Group Calls per Hour per User	Group Call Duration (sec)	I-Calls per Hour per User	I-Call Duration (sec)	Inter-connect Calls per Hour per User	Inter-connect Call Duration (sec)	# of Mobiles	# of Portables	Total Units	% Active during Busy Hour	Total Active Units
1	Public Safety	2.46	6.00	0.20	4.20			800	3200	4,000	17%	660

14) The Grade of Service (GOS) will be split between the two IP Simulcast Systems to meet the original requirement of 0.4 %. The multicast sites will meet or exceed original GOS requirements.

1.3.3.2 VHF IP Simulcast System Capacity / GOS

The VHF IP Simulcast system is based on seven (7) channels with one channel consumed as control channel allows 6 working channels. The details are shown in Figure 25.

1.3.3.2.1 700MHz IP Simulcast System Capacity / GOS

The 700MHz IP Simulcast system is based on 8 channels with one channel consumed as control channel allows 7 working channels. The details are shown in Figure 25.

1.3.3.2.2 Multicast Sites Capacity / GOS

There are 4 Multicast sites that contributed to traffic loading on the system in addition to the two simulcast systems. The details are shown in Figure 25.

Figure 25. Grade of Service for all Systems

	System 1 VHF SC Phase 1 Simulcast	System 2 700M SC Phase 1 IP_Simulcast	System 3 VHF LRL Phase 1 Multisite	System 4 VHF BC Phase 1 Multisite	System 5 VHF KC Phase 1 Multisite	System 6 700M WH Phase 1 Multisite
Enter Max Allowable Delay (sec)	1.00	1.00	1.00	1.00	1.00	1.00
Number of Total Channels	7	8	5	5	4	4
Max # of P2 Channels in P1 Mode (P2 system only)						
Total Number of Voice Talkpaths	6	7	4	4	3	3
Weighted Grade of Service (GOS)	0.13%	0.37%	0.01%	0.00%	0.01%	0.01%
Phase 1 Grade of Service (GOS)	0.13%	0.37%	0.01%	0.00%	0.01%	0.01%

1.3.4 Site Frequencies

The REA21 design relies on the frequencies specified in this statement of work as the basis for the implementation.

1) VHF IP Simulcast System - Seven (7) Channels
2) 700 MHz IP Simulcast System - Eight (8) Channels
3) Lewis Road Landfill VHF Multicast Site - Five (5) Channels
4) Bryant Canyon VHF Multicast Site – Five (5) Channels
5) King City AG VHF Multicast Site – Four (4) Channels
6) Williams Hill 700MHz Multicast Site – Four (4) Channels

1.3.4.1 VHF IP Simulcast System

The frequency plan for the VHF IP Simulcast System will include seven (7) VHF frequency pairs as follows:

	TX	RX
Channel 1	152.03000	157.89000
Channel 2	152.12000	157.98000
Channel 3	152.15000	158.07000
Channel 4	152.18000	158.49000
Channel 5	152.63000	158.58000
Channel 6	152.72000	158.61000
Channel 7	152.81000	158.64000

1.3.4.2 700MHz IP Simulcast System

The 700MHz IP Simulcast System will include eight (8) channels of 700MHz frequencies as follows:

	TX	RX
Channel 1	769.53125	799.53125
Channel 2	769.85625	799.85625
Channel 3	770.34375	800.34375
Channel 4	771.13125	801.13125
Channel 5	771.83125	801.83125
Channel 6	772.71875	802.71875
Channel 7	773.68125	803.68125
Channel 8	774.66875	804.66875

1.3.4.3 Lewis Road Landfill VHF Multicast Site

Site frequencies need to be finalized in preparation for DDR. At this time, the Lewis Road Landfill VHF Multicast site will include five (5) VHF frequency pairs as follows:

	TX	RX
Channel 1	155.77500	159.18000
Channel 2	152.06000	158.52000
Channel 3	154.08500	156.24000
Channel 4	154.75500	158.88000
Channel 5	155.10000	158.94000

1.3.4.4 Bryant Canyon VHF Multicast Site

Site frequencies need to be finalized in preparation for DDR. At this time, the Bryant Canyon VHF Multicast site will include five (5) VHF frequency pairs as follows:

	TX	RX
Channel 1	153.7850	159.2100
Channel 2	154.3550	155.7450
Channel 3	155.4300	156.0600
Channel 4	154.7550	158.8950
Channel 5	155.0400	158.9850

1.3.4.5 King City AG VHF Multicast Site

Site frequencies need to be finalized in preparation for DDR. At this time, the King City AG VHF Multicast site will include four (4) VHF frequency pairs as follows:

	TX	RX
Channel 1	150.9950	153.7850
Channel 2	154.7250	156.1950
Channel 3	155.3100	158.8650
Channel 4	155.6850	159.0150

1.3.4.6 Williams Hill 700MHz Multicast Site

The Williams Hill Multicast site will include four (4) 700MHz channels as follows:

	TX	RX
Channel 1	769.59375	799.59375
Channel 2	770.85625	800.85625
Channel 3	771.50625	801.50625
Channel 4	773.44375	803.44375

1.3.5 Network

The network design, as a result of the changes for REA21, will include a combination of fiber and microwave links supplied by both Harris and Monterey County. The requirements for each link will be the responsibility of the respective parties and will meet the public safety grade specifications as required by Monterey County. Should the requirement change, a re-evaluation of the network design will be required.

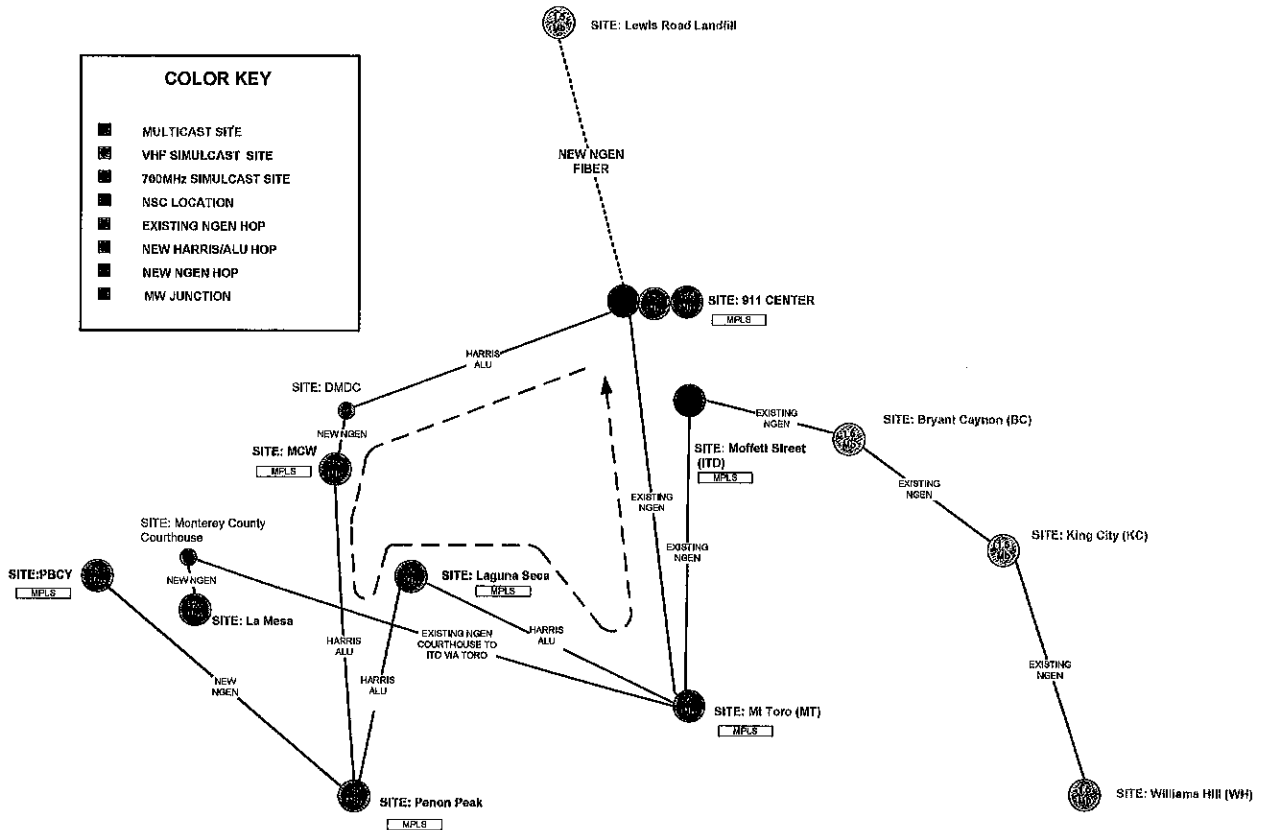### 1.3.5.1 Backhaul System

The NGEN Digital Radio system backhaul involves the combination of microwave hops and MPLS routers to fulfill the desired public safety grade level of operation. The overall system also relies on a combination of different microwave systems installed by wither Harris or Monterey County. The following table is a breakdown of the links and the responsibilities for each supplier.

Link	TYPE	MPLS Router Required	Status	Provided By
911 Center - DMDC	MW	Yes	New (Not Installed)	Harris/ALU
LaguanSeca - Mt Toro	MW	Yes	New (Not Installed)	Harris/ALU
LagunSeca - Penon Peak	MW	Yes	New (Not Installed)	Harris/ALU
MCW-Penon Peak	MW	Yes	New (Not Installed)	Harris/ALU
Bryant Canyon - King City Ag	MW	No	Existing	MC/ITD
ITD _ Bryant Canyon	MW	No	Existing	MC/ITD
King City Ag - Williams Hill	MW	No	Existing	MC/ITD
LewisRoad - 911 Center	Fiber	No	NEW	MC/ITD
911 Center - ITD	MW	Yes	Existing	MC/ITD
911-Monterey Co. Courthouse	MW	Yes	Existing	MC/ITD
DMDC - MCW	MW	No	New (Not Installed)	MC/ITD
LaMesa - Monterey Co. Courthouse	MW	No	New (Not Installed)	MC/ITD
Monterey County Courthouse - ITD	MW	No	Existing	MC/ITD
PBCY - Penon Peak	MW	No	New (Not Installed)	MC/ITD
Mt Toro - ITD	MW	Yes	Existing	MC /ITD

Since there will be two IP Simulcast Systems, each system will have a redundant control point. Both systems will have the primary control point located at the 911 center. The VHF IP Simulcast system will have a secondary control point located at Laguna Seca. The 700MHz Simulcast system will have a secondary control point located at Mt. Toro. Only Site located on the ring and MPLS routers will have full mesh capability.

Figure 26. Backhaul Overview

1.3.5.2 Harris and Monterey County Installed MW Links

For the supplied links, the parties identified in Section 1.3.5.1 (Backhaul System) shall be responsible for the following items.

Item	Description of Work
1	Backhaul Installation Schedule
2	Backhaul Reliability / Availability
3	MW Backup Power
4	Backhaul Procurement (MW/Fiber)
5	Backhaul Installation
6	Backhaul Testing and Verification

1.3.6 Implementation Plan

Harris has considered all of the changes involved with REA 21 and estimated the equipment, services and sub vendor items required to deliver a system that will meet Monterey County and NGEN project requirements.

1.3.6.1 Design Reviews

Due to the extensive changes required for the REA 21 design, Harris requires design reviews both internally and with the customer in order to meet the business operating requirements and ISO standards. Harris will prepare for an internal System Design Review (SDR) and customer Detailed Design Review to be held at a mutually agreeable date and location with Harris, MC and NGEN project personnel.

1.3.6.2 User Migration Plan

A mutually agreed upon user migration plan will need to be developed prior to users transitioning to the trunked system. This will require personality and XGP software updates to terminals. This update will be the responsibility of Monterey County to complete.

1.3.6.3 Site Changes

Harris has evaluated all of the requirements for REA 21 and will execute these site related activities upon approval from MC

Item	Description of Work	Responsible
1	Add UPS batteries	Harris
2	Add ALU batteries	Harris
3	Add generator alarm connections	Harris
4	Provide path studies for the Harris provided microwaves (Harris included pricing for 7 links)	Harris

1.3.6.3.1 VHF IP Simulcast System

A five (5) site, seven (7) channel VHF P25 IP Simulcast system will be introduced using Harris Distributed Control Point (DCP) Technology. The VHF Simulcast system will employ two sites designated as DCP sites, also referred to as Layer 1 sites. One DCP site will be located at the 911 center. The other DCP site will be located at Laguna Seca. Since DCP is a software configuration, the reconfiguration will be performed for during the site reconfiguration to a seven (7) channel IP Simulcast system.

1.3.6.3.2 911 Dispatch Center VHF IP Simulcast Site

The eleven (11) channel VHF non-IP simulcast site will be transitioned to a seven (7) channel IP Simulcast Transmit Site and DCP.

Item	Description of Work	Responsible
1	UPS power system remains the same	MC
2	Microwave connectivity upgrade to MPLS for IP Simulcast and DCP	Harris
3	Re-purpose Traffic Controller and Baseband modules from rack2 to other 700MHz sites	Harris
4	Upgrade all site software as required for SR10A.1 for IP Simulcast and DCP	Harris
5	Configure & Test the Site	Harris

1.3.6.3.3 Laguna Seca VHF IP Simulcast Site

The 11 channel VHF non-IP simulcast site will be transitioned to a seven (7) channel IP Simulcast Transmit Site and DCP.

Item	Description of Work	Responsible
1	UPS power system remains the same. Runtime will increase for 7 versus eleven (11) channels.	Harris
2	Microwave connectivity upgrade to MPLS for IP Simulcast and DCP	Harris
3	Re-purpose Traffic Controller and Baseband modules from rack2 to other 700MHz sites	Harris
4	Upgrade all site software as required for SR10A.1	Harris
5	Configure & Test the Site	Harris
6.	Evaluate relocation of Rx antenna and installation work associated with the relocation	Harris

1.3.6.3.4 MCW VHF IP Simulcast Site

The eleven (11) channel VHF non-IP simulcast site will be transitioned to a seven (7) channel IP Simulcast Transmit Site. The MCW site replaces DMDC simulcast site as a VHF IP simulcast site. The following major tasks will be required at MCW:

Item	Description of Work	Responsible
1	Full Site Development	Harris
2	UPS power system procurement.	Harris
3	UPS Installation	Harris
4	Network connectivity	Harris & MC
5	Install new Antenna Feedlines	Harris
6	Hang new TX and RX and VHF antennas	Harris
7	Sweep the antenna system with new VHF antennas	Harris
8	Purchase Combiner	Harris

Item	Description of Work	Responsible
9	Reconfigure VHF Channels and pre-selector	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.6.3.5 Pebble Beach Corp. Yard (PBCY) VHF IP Simulcast Site

The eleven (11) channel VHF non-IP simulcast site will be transitioned to a seven (7) channel IP Simulcast Transmit Site. The PBCY site replaces Huckleberry Hill (HH) simulcast site as a VHF IP simulcast site. The following major tasks will be required at PBCY:

Item	Description of Work	Responsible
1	Partial Site Development in existing shelter with added Harris provided generator	Harris
2	Re-purpose the HH UPS power system	Harris
3	UPS Installation	Harris
4	Network connectivity	MC
5	Install new Antenna Feedlines	Harris
6	Hang new TX and RX and VHF antennas	Harris
7	Sweep the antenna system with new VHF antennas	Harris
8	Purchase Combiner	Harris
9	Reconfigure VHF Channels and pre-selector	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.6.3.6 Penon Peak VHF IP Simulcast Site

The eleven (11) channel VHF non-IP simulcast site will be transitioned to a seven (7) channel IP Simulcast Transmit Site. The following major tasks will be required at Penon Peak:

Item	Description of Work	Responsible
1	UPS power system remains the same	Harris
2	Microwave connectivity upgrade to MPLS for IP Simulcast and DCP	Harris
3	Re-purpose Traffic Controller and Baseband modules from rack2 to other 700MHz sites	Harris
4	Upgrade all site software as required for SR10A.1 for IP Simulcast and DCP	Harris
5	Configure & Test the Site	Harris

1.3.6.3.7 Lewis Road Landfill VHF Multicast Site

The Lewis Road Landfill will be a five (5) channel VHF multicast site. The following major tasks will be performed at Lewis Road Landfill site:

Item	Description of Work	Responsible
1	Full Site Development -new shelter – new tower	Harris
2	UPS Installation	Harris
3	Backhaul and Network connectivity	MC
4	Install new Antenna Feedlines	Harris
5	Hang new TX and RX and VHF antennas	Harris
6	Sweep the antenna system with new VHF antennas	Harris
7	Purchase Combiner	Harris
8	Use Original 5 Channel Site	Harris
9	Reconfigure VHF Channels and pre-selectors	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.6.3.8   700 MHz IP Simulcast System

A three (3) site, eight (8) channel 700 MHz P25 IP Simulcast system will be introduced using Harris Distributed Control Point (DCP) Technology. The 700MHz Simulcast system will employ two sites designated as DCP sites, also referred to as Layer 1 sites. One DCP site will be located at the 911 center. The other DCP site will be located at Mt Toro. Since DCP is a software configuration, the reconfiguration will be performed during the site upgrades to 8 Channels.

1.3.6.3.9   911 Dispatch Center 700MHz Site

The seven (7) channel 700MHz multicast system will be transitioned to an eight (8) channel IP Simulcast Transmit Site. The following major tasks will be required at 911 Dispatch Center:

Item	Description of Work	Responsible
1	UPS power system remains the same	MC
2	Microwave connectivity upgrade to MPLS for IP Simulcast and DCP	Harris
3	Add Additional combiner cavity for 8 Channel operation	Harris
4	Re-purpose Traffic Controller and Baseband modules from other VHF Simulcast Sites	Harris
5	Upgrade all site software as required for SR10A.1 for IP Simulcast and DCP	Harris
6	Configure & Test the Site	Harris

1.3.6.3.10   Toro 700MHz Site

The seven (7) channel 700MHz multicast system will be transitioned to an 8 channel IP Simulcast Transmit Site. The following major tasks will be required at Mt. Toro:

Item	Description of Work	Responsible
1	UPS power system remains the same	MC
2	Microwave connectivity upgrade to MPLS for IP	Harris

	Simulcast and DCP	
3	Evaluate alternative OMNI Antenna design	Harris / ITD
4.	Uninstall existing antenna and install new OMNI antenna and related antenna site work	Harris
5	Add Additional combiner cavity for 8 Channel operation	Harris
6	Re-purpose Traffic Controller and Baseband modules from other VHF Simulcast sites	Harris
7	Upgrade all site software as required for SR10A.1 for IP Simulcast and DCP	Harris
8	Configure & Test the Site	Harris

1.3.6.3.11 La Mesa 700MHz IP Simulcast Site

La Mesa will be installed as a new 700MHz site and will become one of three sites within a 700MHz P25 Phase 1 IP Simulcast system. The La Mesa Site is an existing site owned by the US Navy and is being leased by MC. The following major tasks will be required at La Mesa:

Item	Description of Work	Responsible
1	UPS power system remains the same	MC/ NAVY
2	Microwave connectivity	MC
3	Antenna feed lines	Harris
4	Install new Antenna Feedlines	Harris
5	Hang new TX and RX and antennas and TTA	Harris
6	Re-sweep the antenna system with new 700MHz antennas	Harris
7	Purchase 700MHz modules and additional Site Interface equipment	Harris
8	Purchase Combiner for 7 Channels	Harris
9	Add Additional combiner cavity for 8 Channel operation	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.6.3.12 Williams Hill 700MHz P25 Phase 1 Multicast Site

The original VHF Williams Hill Site will be replaced as a 700MHz P25 4 channels site. Some of the existing equipment will remain and some will be replaced. Although this was not part of REA 21, it is being included as part of the total package. The following is expected for the site:

Item	Description of Work	Responsible
1	UPS to be installed	Harris
2	Microwave connectivity remains the same	MC
3	Existing Antenna Feedlines will remain	Harris
4	Hang new TX and RX and antennas and TTA	Harris
5	Re-sweep the antenna system with new 700MHz antennas	Harris
6	Re-purpose VHF Simulcast Rack	Harris
7	Purchase 700MHz modules and additional Site Interface	Harris

Item	Description of Work	Responsible
	equipment	
8	Purchase Combiner	Harris
9	Reconfigure VHF Rack for 700MHZ operation Evaluate possibility for one rack with channels and combiner	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.6.3.13   King City VHF Multicast Site

King City has been introduced into the system as a VHF Multicast site. The equipment slated for Williams Hill will be deployed at King City. The following major tasks will be required at King City:

Item	Description of Work	Responsible
1	UPS power system procurement	Harris
2	UPS Installation	Harris
3	Microwave connectivity	MC
4	Install new Antenna Feedlines	Harris
5	Hang new TX and RX and VHF	Harris
6	Sweep the antenna system with new VHF antennas	Harris
7	Re-purpose the Williams Hill VHF Multicast Rack	Harris
8	Purchase Combiner	Harris
9	Reconfigure VHF Channels and pre-selector	Harris
10	Upgrade all site software as required for SR10A.1	Harris
11	Install Site Equipment	Harris
12	Configure & Test the Site	Harris

1.3.7 Manufacturing and Staging

After final design approval, the project team will procure material and schedule manufacturing using its Enterprise Resource Planning system. Orders will be submitted for manufacturing equipment that is required to upgrade all of the sites.

1.3.7.1 Equipment

Harris will drop internal orders for the equipment required for the SR10A.1 Upgrade and subsequent site upgrades. The equipment required for the upgrades will consist of the following major components:

Site Item	Part Number	Description	Qty
911 Dispatch	EA-555008-011	Transmit Module,764-776MHz,MASTR V	1
911 Dispatch	EA-555007-011	Receiver Module,799-817MHz,MASTR V	1
911 Dispatch	SV-AW5L	Power Amplifier,Linear,700 MHz	1
911 Dispatch	EA-555027-003	Oscillator,SecureSync,Rb,Master,AC	2
911 Dispatch	SV-ZN9K	PANEL,XCONNECT,MASTR V	1
LaMesa	EA-555008-011	Transmit Module,764-776MHz,MASTR V	5

Site Item	Part Number	Description	Qty
LaMesa	EA-555007-011	Receiver Module,799-817MHz,MASTR V	5
LaMesa	SV-AW5L	Power Amplifier,Linear,700 MHz	5
LaMesa	EA-555027-003	Oscillator,SecureSync,Rb,Master,AC	2
LaMesa	SV-ZN9K	PANEL,XCONNECT,MASTR V	1
Lewis Road	CY102784V5	Oscillator,10MHz Ref,120/230VAC,6 Port	1
Lewis Road	SV-ZN9K	PANEL,XCONNECT,MASTR V	1
Mt Toro	EA-555008-011	Transmit Module,764-776MHz,MASTR V	1
Mt Toro	EA-555007-011	Receiver Module,799-817MHz,MASTR V	1
Mt Toro	SV-AW5L	Power Amplifier,Linear,700 MHz	1
Mt Toro	EA-555027-003	Oscillator,SecureSync,Rb,Master,AC	2
Mt Toro	SV-ZN9K	PANEL,XCONNECT,MASTR V	1
WilliamsHill700	MASA-SVP25	Site Interface Equipment,P25T MASTR V	1
WilliamsHill700	MASA-NCL7D	Kit,Cable,Ethernet,5ft	1
WilliamsHill700	VSVS01	VS Prod Grp,Dummy Model Number	1
WilliamsHill700	VSCR12	Router,2921,AC,Security,w/Ether Switch	1
WilliamsHill700	VSMN2W	Kit,Mnt Hrdwr,2921/2911 Router	1
WilliamsHill700	SASG9N	Feature,P25 Multisite Support	1
WilliamsHill700	SAMD6J	Kit,Network Sentry Control/Data	1
WilliamsHill700	KT-014845-001	Kit,Feedthru Boot,7/8 in	1
WilliamsHill700	7242	Filter,Lightening,100-512MHz	1
WilliamsHill700	E75-0193-001	ANTENNA, 763-869 MHZ, 10 DBD,OMNI,DIN(F)	1
WilliamsHill700	E75-0194-001	ANTENNA, 794-824 MHZ, 12 DBD,OMNI,DIN(F)	1
WilliamsHill700	CA-015471-001	Cable,Coaxial,1 5/8in,Low Loss Foam	100
WilliamsHill700	CN-015476-001	Connector,N Female,1 5/8 Coax	2
WilliamsHill700	KT-014864-001	Kit,Grounding,W Gnd Lug,For 1 5/8 in Ca	3
WilliamsHill700	DSXL-MA-BF	Surge Protector,Coaxial	1
WilliamsHill700	NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	1
WilliamsHill700	CA-015466-001	Cable,Coaxial,1/2in Superflex	80
WilliamsHill700	NF-SCF12-070	Connector,NF For 1/2in Coaxial	1
WilliamsHill700	716F-NM	Adapter,7/16F to NM	1
WilliamsHill700	NM-SCF12-071	Connector,NM For 1/2in Coax,Right Angle	4
WilliamsHill700	NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	4
WilliamsHill700	W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	1
WilliamsHill700	AM-016950-001	Amplifier,TTA,700/800MHz	1
WilliamsHill700	W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	1
WilliamsHill700	A30-0936-005	FILTER, 792-806 MHZ FREQ RANGE, 6MHZ BW	1
WilliamsHill700	CN-009256	Connector,NF,7/8in Coax,O-Ring Sealing	2
WilliamsHill700	CA-015474-001	Cable,Coaxial,7/8in,Low Loss Foam	100
WilliamsHill700	KT-018357-001	Kit,Grounding For 7/8in Coaxial,60in	3

Site Item	Part Number	Description	Qty
WilliamsHill700	NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	2
WilliamsHill700	CA-015465-001	Cable,Coaxial,1/4in Cellflex	60
WilliamsHill700	W90-0100-011	CABLE ASSY, SURE FLEX N MALE-N MALE 6FT	1
WilliamsHill700	J95-0026-001	CONN BNC (M), 1/4" CORREGATED COAX	4
WilliamsHill700	J95-0026-002	CONN N (M), 1/4" CORREGATED COAX	4
WilliamsHill700	NM-LCF12-070	Connector,NM For 1/2in Coaxial	1
WilliamsHill700	LCF12-50J	Cable,Coaxial,1/2in Low Loss,LCf12-50J	100
WilliamsHill700	KT-018357-002	Kit,Grounding For 1/2in Coaxial	3
WilliamsHill700	CN-014877-001	Connector,N Female,For 1/2in Coax	1
WilliamsHill700	NM-SCF12-070	Connector,Rapid Fit,SCF12-50 NM	2
WilliamsHill700	CA-015466-001	Cable,Coaxial,1/2in Superflex	10
WilliamsHill700	A33-0001-004	COMBINER,TX,700 MHZ,4CH. DIN	1
WilliamsHill700	EA-555008-011	Transmit Module,764-776MHz,MASTR V	4
WilliamsHill700	EA-555007-011	Receiver Module,799-817MHz,MASTR V	4
WilliamsHill700	SV-AW5L	Power Amplifier,Linear,700 MHz	4
WilliamsHill700	CY102784V5	Oscillator,10MHz Ref,120/230VAC,6 Port	1

1.3.7.2 Site Staging

To the extent possible Harris recommends pre-staging, configuration and testing of the VHF simulcast system in conjunction with the SR10A.1 NSC upgrade and IP Simulcast changes at the Harris facility in Salinas prior to deployment to the site. This would allow the sites to be upgraded, configured and re-tuned prior to installation. Sites that are already installed would have to be upgraded on site. The following site would require upgrade on site:

1) Laguna - SecaVHF Simulcast site
2) Penon Peak - VHF Simulcast site
3) Mt Toro - 700 MHz Multicast site
4) La Mesa - 700 MHz Multicast site
5) 911 Center - 700 MHz Multicast site

1.3.7.3 Factory Test Plan

Harris will stage the SR10A.1 equipment in Lynchburg, Virginia and test the equipment according to the Factory Test Plan. The County may send representatives to witness staging. Harris and the County shall mutually agree upon the preliminary Factory Test Plan during DDR.

Harris will stage the Distributed Control Point (DCP) equipment in Salinas, California and test the equipment according to the Factory Test Plan. The County may send representatives to witness staging. Harris and the County shall mutually agree upon the preliminary Factory Test Plan during DDR.

1.3.8 System Acceptance

Harris shall provide notice ten days prior to the start of acceptance testing. Acceptance testing shall begin upon completion of installation. Acceptance tests include functional tests, coverage tests, and a 45-Day Reliability Test.

The system engineer will provide documentation defining each of the test areas. The ATP procedures contain a short description, test methodology, and a record form for logging results and acceptance signatures for each test. A punch list will document any issues found. The goal of the team will be their quick resolution. Follow-up documents will show the correction of open items. Upon satisfactory completion of each testing phase, the project manager will present the system acceptance documentation to County's project manager. The following cutover section describes the planning and preparation efforts required to enact the cutover plan

Figure 27. Acceptance Testing Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Provide appropriate team members to participate in acceptance tests		X	Customer witness
Inspect each network center, noting discrepancies on the punch list	X		Customer witness
Submit site inspection results	X		
Approve site inspection results		X	
Perform functional ATP on radio system, sites, and dispatch consoles	X		Customer witness
Submit functional ATP results	X		
Approve functional ATP results		X	

1.3.8.1 Final Acceptance

With the completion of ATP tests, cutover, and submission of the final drawing package, the project manager will submit the final system acceptance letter for the County to sign. With the final acceptance, the project manager will arrange a meeting with the field service team to review maintenance support during the warranty period. The team will provide the contact information and procedures used to obtain service during the warranty period. Contact numbers and procedures will be provided for standard business hours and after hours.

Figure 28. Final Acceptance Responsibility Matrix

Tasks	Harris	County of Monterey	Comments
Removal of decommissioned NSC equipment	X		
Submit final drawing package	X		
Submit letter of final system acceptance	X		
Provide warranty and contact information	X		

Tasks	Harris	County of Monterey	Comments
Meet with Harris to review warranty contact procedures		X	
Meet with Harris to outline system support and services requirements		X	
Accept final drawing package		X	
Sign letter of final system upgrade acceptance		X	

1.3.8.2 Warranty Support

This Amendment #3 includes a one-year warranty on infrastructure equipment. Warranty coverage includes all necessary parts, labor, transportation, shipping to the customer, and other items normally required and/or consumed in maintaining the proposed equipment in order to meet original factory specifications at no cost to the County. The warranty period begins after final system acceptance.

2. Software FX

2.1.1 Software FX Program

Harris is providing Monterey software maintenance through our Software FX plan during the one year warranty period. The Software FX program provides periodic updates/upgrades for Harris licensed software within the system infrastructure and radio products. Software updates/upgrades may include major and/or minor releases. Harris targets major system level releases annually. Harris targets minor releases for individual application and radio software upgrades semi-annually. Software releases deliver as a package to ensure reliability and compatibility across system components. Software updates include enhancements, corrections, and the ability to enable licensed features that may be optionally available in a given release. Software FX also provides monthly security-related patches for Microsoft® Products, Linux, McAfee®, Adobe®, JAVA™ and other related database products contained in the Harris system offering. Harris rigorously tests each vendor mitigation and update on a dedicated security verification test system. Each security update includes a security update summary and security release notes. In addition, the Harris security team continually monitors product vulnerability alerts and critical commercial software and anti-virus updates.

Access to various on-line support tools via a secure website, Tech-Link, and technical support Monday-Friday during normal business hours via telephone, internet, and fax are also included.

Software FX supports optimal system performance and provides subscribers the necessary updates to support future upgrade compatibility, which affords subscribers the cleanest and smoothest upgrades possible.

Software FX services require execution of a separate Software FX Agreement, which shall be provided upon request.

2.1.2 Post Warranty Software FX (Option)

Harris has included optional rates for annual Software FX subscription fees.

3. Schedule

Harris has provided a preliminary project schedule as part of this scope of work in the form of a Microsoft Project Gantt chart. The preliminary high-level schedule shows the time frame of each project step. A more detailed schedule will be presented during the DDR and critical path will be identified during DDR. This schedule will take into account the results of site surveys, list each major milestone, and define each party's responsibility, allowing the reader to quickly understand the timing and required inter-relationships. The detailed schedule will also incorporate the feedback given by the customer during the initial project meetings. Throughout the project, the project manager will review project progress as compared to the schedule. In order to maintain the project schedule, he or she will take necessary actions to focus on and resolve problems (actual and potential). The customer will receive monthly project updates.

4. Pricing

4.1 Firm Fixed Price Disclaimer

Pricing is valid until June 26, 2015, unless otherwise stated. Discounts and pricing are based upon execution of all 3 components of Amendment #3.

SR10A.1	
SR10A.1 List Price	**$1,228,651.00**
BeOn Enterprise with 500 user licenses: 490 Android/iOS 10 Windows	Included
Less Amendment #3 Discount	*($783,651.00)*
SR10A.1 TOTAL	*$445,000.00*
REA 21 Plan C	
REA 21 Plan C	**$1,081,343.00**
Less Amendment #3 Discount	*($423,011.00)*
REA 21 Plan C TOTAL	*$658,332.00*
Console Upgrade	
25 C3 Maestro Console Replacement	**$951,125.00**
Less Amendment #3 Discount	*($650,953.00)*
Console Upgrade TOTAL	*$300,172.00*
Amendment #3 Total List Price	*$3,261,119.00*
Amendment #3 Total Discounts	*($1,857,615.00)*
Sales Tax	$88,933.25
Shipping Costs	Included
Amendment #3 Price	$1,492,437.25

* To be executed via stand-alone Software
FX Agreement

Options	
Annual Software FX/SUMS Subscription Fee	*$109,000*
BeOn Enterprise Server Upgrade List Price (501 – 5,000 Users)*	$54,000
BeOn Enterprise Server Upgrade Discount (27% Discount)	($14,580)
BeOn Enterprise Server Upgrade Selling Price**	$39,420

BeOn User License Pricing:
 	
   ▪ Android/iOS Smartphone Clients (5 license pack)
 	
   ▪ Windows Clients (per client)
	Android/iOS List Price (5pack): $1,575
	
	Discount Price(27%): $1,150
	
	Windows Client List Price: $1,695
	
	Discount Price(27%): $1,218

Note on the BeOn Enterprise Server Upgrade option: Harris and Monterey County will need to review the bandwidth and firewall requirements and configurations to ensure grade of service. Additional equipment to meet grade of service, firewall products, or related services are not included.

**Taxes not included. BeOn Option pricing is contingent based upon execution of all 3 components of Amendment #3 and is valid until December 2017.*

5. Payment

Milestone payments are associated with Amendment 3 pricing only.

Amendment 3 Payment Milestones		
Amendment 3 Execution	$	280,700.80
Amendment 3 CDR	$	280,700.80
Amendment 3 Equipment Delivery	$	280,700.80
Amendment 3 Equipment Installation	$	280,700.80
Taxes	$	88,933.25
Amendment 3 Final Acceptance	$	280,700.80
	$	1,492,437.25