Commonwealth of Virginia Statewide Agencies Radio System (STARS)

Request for Proposal 2001-035

Revised 11-02-01 (ADDENDUM 2)

Scott Fairholm
Agency Director
e-mail:
sfairholm@dit.state.va.us

COMMONWEALTH of VIRGINIA

Department of Information Technology
Acquisition Services Division
110 S. 7th Street
Richmond, Va. 23219
(804) 371-5000

TDD VOICE-- TEL NO
804/371-8076

November 2, 2001

ADDENDUM NO. 2

TO ALL SI OFFERORS:

Reference:	RFP No.:	2001-035
	Issued:	August 1, 2001
	Commodity:	Systems Integrator for the COV Statewide Agencies Radio System (STARS)
	Commodity #:	90728
	Using Agency:	Commonwealth of Virginia Secretary of Public Safety Thru: Virginia Department of State Police
	DUE DATE:	**November 28, 2001; 4:00 p.m.**

Please note the change(s) made to this program:

Reference Page 7, Section 1.10, entitled, "Offeror's Understanding of Requirements" Note the change of the date and time for receipt of ALL e-mail inquires pertaining to this solicitation. **"All other e-mail inquires must be received by 4:00 p.m., November 7, 2001. No further e-mail inquiries will be accepted after that date."**

Reference Pages noted below. Changes have been made to the RFP Sections delineated below. Replacement pages are provided with the deleted changes in "strikeout" and additional information in bold.

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A signed acknowledgement of this addendum must be received by this office either prior to the proposal due date and hour **or** attached to your proposal. Signature on this addendum does not constitute your signature on the original proposal document. The original proposal document must be signed also.

_____
Name of Firm

_____
Signature

_____
Date

Very truly yours,

Signature on File

Teresa M. Hudgins, CPPB, VCO
STARS Procurement and Contract Officer
Phone: 804-674-2444
E-mail: thudgins@vsp.state.va.us

1.3 Issuing Office

Commonwealth of Virginia
Department of Information Technology
Acquisition Services Division
110 S. 7th Street, Suite L100
Richmond, Virginia 23219
Attention: Teresa M. Hudgins

This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia,* § 11-35.1 or against a bidder or offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

1.4 Issuing Date:

This Request for Proposal is being issued ~~July 31~~**August 1**, 2001. The official solicitation is posted on the Department of Information Technology/Acquisition Services Division website under "Current Bids". If unable to download from the website, please contact Teresa M. Hudgins at 804-674-2444 or via e-mail at thudgins@vsp.state.va.us

1.5 Closing Date and Time

The original and fifteen (15) additional identical printed copies of the technical proposal to include .pdf format for each of the two (2) scenarios as described in sections 4 and 5 of this RFP must be submitted under separate cover and must contain the full name and address of every company bearing an interest in the proposal. The original technical proposal(s) and cost proposal(s) for each of the two (2) scenarios must be signed by the Offeror's contractually binding authority. The cost proposal(s) for each of the two (2) scenarios must be submitted in a separate clearly marked and sealed package. One original and twelve (12) additional identical printed copies of the cost proposal for each of the two (2) scenarios is required to include twelve completed Microsoft Excel version in .xls format, of the pricing forms as provided with the RFP. Offerors are also requested to provide fifteen (15) copies of additional product descriptions and supportive material in separate binders.

All proposals must be received not later than 4:00 p.m. local time, ~~Friday, September 28~~**Wednesday, November 28**, 2001.

1.6 Freedom of Information Act (FOIA) Limitations

In accordance with the Code of Virginia, § 2.1-342.01 (45) and § 2.1-342.01 (69) disclosure of documentation that would jeopardize Commonwealth of Virginia security, employee safety or other information as protected by the Code of Virginia, will not be open to public disclosure. On the date of RFP issuance, the Commonwealth will have available for pick up by potential Offerors confidential & protected documents that will assist them in the preparation of their proposals. Potential Offerors are to call Teresa M. Hudgins at 804-674-2444 for an appointment to pick up the documents at the Virginia Department of State Police, STARS office, 7700 Midlothian Turnpike, Richmond, VA, between the hours of 8:30 a.m. and 4:00 p.m. Documents will not be available during the 12:00 noon to 1:00 p.m. timeframe. Documents will be provided, following receipt of a signed Non Disclosure Agreement. Recipients of confidential information shall, within 10 days of notification of a Notice of Intent or Award or Notice of Award for this RFP, return the original and any copies of the confidential information to Teresa M. Hudgins, Department of Information Technology, Acquisition Services Division, 110 S. 7th Street, Suite L100, Richmond, VA 23219.

1.7 Plan of Finance

The COV will evaluate financing alternatives that contribute to cost savings, or otherwise benefit the COV, as part of the proposal. Such plans include vendor financing or leasing arrangements. All financing plans must recognize that the COV's obligation to make payments under any financing agreement or contract is solely contingent upon appropriations made by the Virginia General Assembly.

The General Assembly cannot be legally required to appropriate moneys for such payments and the failure to appropriate would leave the COV without the funds to make payments under the Contract. Financing plans should also consider other potential sources of revenues along with appropriations from the COV.

1.8 Rules Regarding Late Proposals and Modifications

No proposal or modifications to a proposal will be accepted after the closing date and time.

STARS Project
P. O. Box 27472
Richmond, Virginia 23261-7472
E-mail: thudgins@vsp.state.va.us

All e-mail inquiries prior to the pre-proposal conference must be received by the Issuing Office by 4:00 p.m., August 10~~31~~, 2001, sent to the attention of Teresa M. Hudgins at thudgins@vsp.state.va.us. Facsimiles are not acceptable. All other e-mail inquires must be received by 4:00 p.m., ~~August 28, 2001~~ **November 7, 2001**. No further e-mail inquiries will be accepted after that date. Document e-mail subject as "Questions concerning RFP 2001-035". COV responses to questions will be posted on the DIT/Acquisition Services Division and Virginia State Police (VSP) website (See section 1.23 for website address).

1.11 Identification of Proposals

All proposals submitted for consideration shall be clearly marked on the outside cover of all envelopes, boxes or packages:

From: Name of Offeror
Street or P.O. Box Number
City, State, Zip Code
Due Date: **November** ~~September~~ 28, 2001 Time: NLT 4:00 p.m. (Local time)
RFP Number: 2001-035

*Note - Offerors: Submit the technical and cost proposals in separate, sealed packages with the appropriate label, i.e., "Technical Proposal" or "Cost Proposal" for each of the two (2) Scenarios (See paragraph 1.15.1 b).

1.12 Specifications are the property of the Commonwealth

These specifications in their entirety are the property of the Commonwealth. The Offeror shall not copy or disseminate any portion of these specifications without express written authorization of the Commonwealth, except as necessary in the preparation of their proposal. Any authorized copies of these specifications or portions thereof shall include a similar paragraph prohibiting further copying or dissemination.

The Issuing Office will schedule a time for the presentation. All presentations shall be conducted by Offerors in Richmond, Virginia. All costs incurred by Offerors to provide oral presentations are the responsibility of the Offeror. Oral presentations are an option of the purchasing agency and may or may not be conducted. During this oral presentation, the following limits are to be observed:

- Discussion of equipment is to be confined to the configurations and level of equipment recommended in the Proposal, including future capabilities for expansion of the system.
- Discussion of systems applications is to be limited to capabilities presently available or to software being specifically developed for the configuration and level of equipment proposed.
- Discussion of the financial aspect of the proposal.

1.15 Proposal Preparation and Submission Requirements:

1.15.1 General Requirements:

a. RFP Response: In order to be considered for selection, Offerors must submit a complete response to this RFP for both scenarios. One (1) original printed (technical and cost) and fifteen (15) printed copies of each technical proposal, fifteen (15) Adobe Acrobat (.pdf) copies on CD media, and twelve (12) printed cost proposals (completed Excel copies) and twelve (12) Microsoft Excel (.xls) format copies on CD media of the pricing forms as provided with the RFP for both scenarios.

b. Offerors are expected to submit two separate proposals that will include technical and cost proposals for both Scenario 1 and 2 to be submitted in separate, sealed packages with the appropriate label, i.e**., "Scenario 1 - COV ownership Technical Proposal"** (~~Commonwealth~~**COV** ownership of the infrastructure, non-fixed equipment, transmitter sites, and two control facilities; COV maintenance of these equipments, sites, and facilities**(equipping and training COV to perform the required operations and maintenance tasks)**; and COV operation and maintenance of the system) or **"Scenario 1 Cost Proposal"** and **"Scenario 2 – SI ownership Technical Proposal"** (SI ownership of the transmitter sites (including towers and land), infrastructure, non-fixed equipment, and two network control facilities~~,~~

(the seven VSP Division Communication Centers are not included**)**. SI maintenance of these sites, equipments, communication centers, and facilities; and SI operation of the system with COV oversight**. Ownership of the sites and facilities will revert back to the Commonwealth at the conclusion of the contract.**) or **"Scenario 2 Cost Proposal"**

c. Proposal Preparation:

1. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in the purchasing agency requiring prompt submission of missing information and/or giving a lowered evaluation of the proposal.
Proposals that are substantially incomplete or lack key information may be rejected by the purchasing agency

2. Proposals should be prepared simply and economically, providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

3. Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. The proposal should cite the paragraph number and repeat the text of the requirement as it appears in the RFP. All sections of the RFP are to be addressed in the Offerors proposal. If a response covers more than one page, the paragraph number should be repeated at the top of the next page. The proposal should contain a table of contents that cross references the RFP requirements. Information that the Offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at an appropriate place or be attached at the end of the proposal and designated as additional material.

1.17 Award of Contract:

Selection shall be made of two or more Offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation factors and testing included in the Request for Proposals, including price, if so stated in the Request for Proposals. (See paragraph 1.15 above) Negotiations shall be conducted with the Offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each Offeror so selected, the agency shall select the Offeror, which in its opinion, has made the best proposal, and shall award the contract to that Offeror. The Commonwealth may cancel this Request for Proposals or reject proposals at any time prior to an award, and is not required to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous. (Section 11-65D, *Code of Virginia*.) Should the Commonwealth determine and in its sole discretion that only one Offeror is fully qualified, or that one Offeror is clearly more highly qualified than the others under consideration, a contract may be negotiated and awarded to that Offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of the solicitation and the Systems Integrator's proposal as submitted, and represented by negotiations.

1.18 Execution of Contract

Upon successful completion of negotiations with the successful Offeror, a contract will be executed. The notice to proceed for the executed contract will not be issued until sites and frequencies are in place for the entire project**, and a paper study for frequency research has been performed**. Incorporated by reference into the contract that is to be entered into by the Commonwealth and Systems Integrator pursuant to this RFP may be: (1) all information presented in or with this RFP and the Offeror's response thereto; and all written communications between the Commonwealth and the Offeror after the issuance of the RFP.

1.19 News Releases:

No public disclosure or news release pertaining to this procurement shall be made without prior written approval of the Issuing Office. FAILURE TO COMPLY WITH THIS PROVISION MAY RESULT IN THE OFFEROR BEING DISQUALIFIED.

All information requested by this RFP on the ownership, utilization and planned involvement of small businesses, women-owned businesses and minority-owned businesses must be submitted. If an Offeror fails to submit all information requested, the purchasing agency may require prompt submission of missing information after receipt of vendor proposals.

Instructions for providing the required information, including definitions and forms are included as Appendix "N" to this RFP. You are not required to use the forms so long as the minimum information required is provided in the prescribed format.

1.23 Acquisition Services Division (ASD) Website

ASD maintains a website at http://asd.state.va.us, which contains the official copy of this solicitation and all amendments.

Offerors are requested to check this website prior to submitting proposals, in the event the RFP is extended or is amended. It is the Offeror's responsibility to submit a proposal containing the latest version of this solicitation, with all signed amendments. Answers to all questions submitted following the pre-proposal conference will be posted to this website, as will the Award.

The Virginia State Police (VSP) website will have a duplicate set of documents at http://www.vsp.state.va.us located under the section entitled, "Statewide Agencies Radio System (STARS).

1.24 Reporting and Delivery Requirements

A. Refer to Section 4.20 and Table 4-3 for reporting requirements.

B. Utilization of small businesses and businesses owned by women and minorities: The following reports shall be submitted as indicated.

1.24.1 Periodic Progress Reports/Invoices

The Systems Integrator shall provide a report on **actual** involvement of small businesses and businesses owned by women and minorities **as part of their periodic invoices**~~within 60 days after completion of the project to the contract officer~~. **The involvement report only, should be addressed to the Contract Officer.** This report will specify the actual dollars contracted to be spent to date with such businesses, actual dollars expended to date

with such businesses, ~~the total dollars planned to be contracted with such businesses,~~ and the total dollars planned to be contracted with such businesses on this contract. This information shall be provided separately for small businesses, women-owned businesses and minority-owned businesses.

1.24.2 Final Actual Involvement Report

The Systems Integrator shall submit to the contract officer within 10 days of contract completion, a report on the actual dollars spent with small businesses and businesses owned by women and minorities during the performance of this contract. At a minimum, this report shall include for each firm contracted with, and for each such business class (i.e. small, women-owned, minority-owned) a comparison of the total actual dollars spent on this contract with the planned involvement of the firm and business class as specified in the proposal, and the actual percent of the total estimated contract value.

The format is as follows:
Business Class: (small, women-owned, or minority-owned)

FIRM NAME, ADDRESS AND PHONE NO.	**TYPE GOODS/ SERVICES**	**ACTUAL DOLLARS**	**PLANNED DOLLARS**	**% OF TOTAL CONTRACT**
TOTAL FOR BUSINESS CLASS				

goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the public body shall offer the individual, within a reasonable period of time after the date of this objection, access to equivalent goods, services, or disbursements from an alternate provider.

3.1.23 eVA Business-To-Government Vendor Registration

The eVA Internet electronic procurement solution, web site portal www.eva.state.va.us, streamlines and automates government purchasing activities in the Commonwealth. The portal is the gateway for vendors to conduct business with state agencies and public bodies.

All vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet e-procurement solution either through the eVA Basic Vendor Registration Service or eVA Premium Vendor Registration Service, and complete the Ariba Commerce Services Network registration.

a. eVA Basic Vendor Registration Service: $25 Annual Fee plus a Transaction Fee of 1% per order received. The maximum transaction fee is $500 per order. eVA Basic Vendor Registration Service includes electronic order receipt, vendor catalog posting, on-line registration, and electronic bidding, as they become available.

b. eVA Premium Vendor Registration Service: $200 Annual Fee plus a Transaction Fee of 1% per order received. The maximum transaction fee is $500 per order. eVA Premium Vendor Registration Service includes all benefits of the eVA Basic Vendor Registration Service plus automatic email or fax notification of solicitations and amendments, and ability to research historical procurement data, as they become available.

c. Ariba Commerce Services Network Registration. The Ariba Commerce Services Network (ACSN) registration is required and provides the tool used to transmit information electronically between state agencies and vendors. There is no additional fee for this service.

Note: Vendors are strongly encouraged to register your company prior to submitting a bid or offer. Failure to register will result in your offer being found non-responsive and rejected. All vendors must register in both the eVA and the Ariba Commerce Services Network Vendor Registration Systems.

3.2 Special Terms and Conditions

3.2.1 Asbestos

Whenever and wherever during the course of performing any work under this contract, the Systems Integrator discovers the presence of asbestos or suspects that asbestos is present, they shall stop the work immediately, secure the area, notify the building owner and await positive identification of the suspect material. During the downtime in such a case, the Systems Integrator shall not disturb any surrounding surfaces but shall protect the area with suitable dust covers. In the event the Systems Integrator is delayed due to the discovery of asbestos or suspected asbestos, then a mutually agreed extension of time to perform the work shall be allowed the Systems Integrator but without additional compensation due to the time extension.

3.2.2 As Built Drawings

The Systems Integrator shall provide the Commonwealth a clean set of reproducible "as built" drawings and wiring diagrams. The Systems Integrator shall also provide the Commonwealth with maintenance manuals, parts lists and a copy of all warranties for all equipment. All "as built" drawings and wiring diagrams, maintenance manuals, parts lists and warranties shall be delivered to the Commonwealth upon completion of the work and prior to final payment. (See Section 4.11.3 (J) (K) and 4.13.1).

3.2.3 Audit

The Systems Integrator shall retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner.

The agency, its authorized agents, and/or state auditors shall have full access to and the right to examine any of said materials during said period.

3.2.4 Authorized Users

The Department of Information Technology/Acquisition Services Division is issuing this solicitation in cooperation with other agencies and institutions. Requirements of the following agencies have been combined within this solicitation.

Dept. of Aviation	Dept. of Fire Programs	Dept. of Mines, Minerals and Energy
Dept. of Alcoholic Beverage Control	Dept. of Forestry	Dept. of Motor Vehicles
Capitol Police	Dept. of Game and Inland Fisheries	Dept. of State Police
Dept. of Cons~~v~~ervsation and Recreation	Dept. of Health	Department of Transportation
Dept. of Corrections	Dept. of Information Technology	VA Marine Resource Commission
Dept. of Emergency Management	Dept. of Juvenile Justice	Federal Government
Dept. of Environmental Quality	Dept. of Military Affairs	Localities within the Commonwealth

The Department of Information Technology/Acquisition Services Division is responsible for administering the program; therefore, correspondence should be directed to the Department of Information Technology/Acquisition Services Division. Non-confidential portions of this contract will be available to Commonwealth of Virginia agencies, other public bodies as defined in the Virginia Public Procurement Act, Section 11-37 and Federal agencies.

3.2.14 Identification Of Proposal

All proposals submitted for consideration shall be clearly marked on the outside cover of all envelopes, boxes or packages:

From: Name of Offeror
Street or P.O. Box Number
City, State, Zip Code
Due Date: September 28, 2001 Time: NLT 4:00 p.m. (Local time)
RFP Number: 2001-035

Note: The technical and cost proposals for both Scenario 1 and 2 proposals are to be submitted in separate, sealed packages with the appropriate label, i.e**., "Scenario 1 - COV ownership Technical Proposal"** (C**OV**~~ommonwealth~~ ownership of the infrastructure, non-fixed equipment, transmitter sites, and two control facilities, COV maintenance of these equipments, sites, and facilities **(equipping and training COV to perform the required operations and maintenance tasks)**; and COV operation and maintenance of the system) or **"Scenario 1 Cost Proposal"** and **"Scenario 2 – SI ownership Technical Proposal"** (SI ownership of the transmitter sites, (including towers and land), infrastructure, non-fixed equipment, and two network control facilities, (the seven VSP Division Communication Centers are not included); SI maintenance of these sites, equipments, communication centers, and facilities; and SI operation of the system with COV oversight**. Ownership of the sites and facilities will revert back to the Commonwealth at the conclusion of the contract.**) or **"Scenario 2 Cost Proposal"**

Proposals may be hand delivered to the designated location in the office issuing the solicitation. No other correspondence or other proposals should be placed in the envelope, box or package.

3.2.15 Indemnification

Systems Integrator agrees to indemnify, defend and hold harmless the Commonwealth of Virginia, its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the Systems Integrator/any services of any kind or nature furnished by the Systems Integrator, provided that such liability is not attributable

to the sole negligence of the using agency or to failure of the using agency to use the materials, goods, or equipment in the manner already and permanently described by the Systems Integrator on the materials, goods or equipment delivered.

Any Contract entered into shall not contain provisions that would have the Commonwealth indemnify or hold harmless a third party.

3.2.16 Liquidated Damages, Furnish And Install

Work shall begin after receipt of contract and all work shall be completed in accordance with the schedule in Section 2 and requirements of the contract. It is hereby understood and agreed by the Offeror that time is of the essence in the delivery of supplies, services, materials, and equipment. Because installation in accordance with the implementation schedule is of critical importance to the COV and because damages would be difficult to quantify, the SI and COV agree to the following liquidated damages, in addition to any other remedies.

Delayed Installation: For each day of delay, in each phase and for final acceptance of the system, as the sole result of the actions or inaction of the SI, and not excused for the inability to obtain any site or sites or the required zoning or other permits for any site or sites, there will be deducted, not as a penalty but as liquidated damages, the amount of $3,000 per calendar day of delay. Since the effect of delay is compounded over time, with a commensurate increase in cost to the Commonwealth, the liquidated damages will increase to $5,000 per day after thirty (30) days. Except, that if the installation is delayed by any act, negligence, or default on the part of the Commonwealth, public enemy, war, embargo, fire, or explosion not caused by the negligence or intentional act of the Systems Integrator or their supplier(s), or by riot, sabotage, or labor trouble that results from a cause or causes entirely beyond the control or fault of the Systems Integrator or their supplier(s), a reasonable extension of time as the procuring public body deems appropriate may be granted. Upon receipt of a written request and justification for an extension from the Systems Integrator, the Contract Officer may extend the time for performance of the contract herein specified at the purchasing office's sole discretion for good cause shown.

Disaster: Because the system is the essential ingredient in the COV public safety and public service activity, restoration of reduced system service is of critical importance to the COV. Damages would be difficult to quantify, the SI and COV agree to the following liquidated damages, in addition to any other remedies:

If the Systems Integrator fails or refuses to replace or correct the deficiency, the office issuing the purchase order may have the materials corrected or replaced with similar items and charge the Systems Integrator the costs occasioned thereby or obtain an equitable adjustment in the contract price.

3.2.25 Work Site Damages

Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to the Commonwealth's satisfaction at the Systems Integrator's expense.

3.2.26 eVA Business-To-Government **Contracts**~~Web Site~~

The eVA Internet electronic procurement solution, web site portal www.eva.state.va.us, streamlines and automates government purchasing activities in the Commonwealth. The portal is the gateway for vendors to conduct business with state agencies and public bodies.

Vendors desiring to provide goods and/or services to the Commonwealth shall participate in the eVA Internet e-procurement solution and agree to comply with the following:

a. Submit a fully executed American Management Systems, Inc., (AMS) Trading Partner Agreement, a copy of which can be accessed and downloaded from www.eva.state.va.us. AMS is the Commonwealth's service provider to implement and host the eVA e-procurement solution.

b. Provide an electronic catalog (price list) for items awarded under a term contract. The format of this electronic catalog shall conform to the eVA Catalog Interchange Format (CIF) Specification that can be accessed and downloaded from www.eva.state.va.us.

Note: Failure to comply with the above requirements will be just cause for the Commonwealth to reject your offer or terminate this contract for default.

~~The eVA Web site, developed by the Department of General Services (DGS), streamlines and automates governmental purchasing activities in the Commonwealth. The eVA portal is the gateway for vendors to conduct business with state agencies and public bodies.~~

~~Vendors desiring to provide products and/or services to the Commonwealth shall participate in the eVA Internet e-procurement solution either through eVA Basic Vendor Registration Service or eVA Premium Vendor Registration Services:~~

~~b.eVA Basic Vendor Registration Service: $25 Annual Fee plus a Transaction Fee of 1% per order filled. The maximum transaction fee is $500 per order. EVA Basic Vendor Registration Service includes electronic order receipt, vendor catalog posting, on-line registration, and electronic bidding.~~

~~b. eVA Premium Vendor Registration Service: $200 Annual Fee plus a Transaction Fee of 1% per order filled. The maximum transaction fee is $500 per order. 3VA Premium Vendor Registration Service includes all benefits of the eVA Basic Vendor Registration Service plus automatic email or fax notification of solicitations and amendments, and ability to research historical procurement data.~~

~~In addition and prior to or within 5 calendar days after receipt of award notification, the Contractor shall submit:~~

~~a. a fully executed American Management Systems, Inc., (AMS) *Trading Partner Agreement*, a copy of which can be accessed and downloaded from www.eva.state.va.us. DGS/DPS has partnered with AMS to implement and host the eVA e-procurement solution.~~

~~b.an electronic catalog (price list) for items awarded under a term contract. The format of this electronic catalog shall conform to the eVA Catalog Interchange Format (CIF) Specification that can be accessed and downloaded from www.eva.state.va.us.~~

~~Failure to comply with the requirements set forth herein may result in rejection of the proposal.~~

3.2.27 Modification

Any Contract issued on a firm fixed price basis may not be increased more than twenty-five percent (25%) or $50,000.00 whichever is greater, without the approval of the Governor of the Commonwealth of Virginia or his authorized designee.

3.2.28 Property Ownership

In the event of termination of the Contract for any reason, all property owned by the COV prior to award of this Contract shall revert back to the COV's ownership after the COV submits payment for all actual improvements.

3.2.29 Interpretation Of Contract

Headings are for reference purposes only and shall not be considered in constructing this Contract.

The documents comprising this Contract, and their order of precedence in case of conflict, are: (1_____. The foregoing documents represent the complete and final agreement of the parties with respect to the subject matter of this Contract.

If any term or condition of this Contract is found to be illegal or unenforceable, it shall be severed, and the validity of the remaining terms and conditions shall not be affected.

Nothing in this Contract shall be construed as an express or implied waiver of the Commonwealth's sovereign or Eleventh Amendment immunity, or as a pledge of its full faith and credit.

3.3 Information Technology Terms And Conditions

3.3.1 **Section Not Used.**~~Uniform Computer Information Transaction Act~~

~~The Commonwealth and Systems Integrator hereby agree that any computer information transaction related to this Agreement or material delivered hereunder, shall not be governed to any extent by the Uniform Computer Information Transaction Act ("UCITA"), but rather shall be governed entirely by Virginia law other than UCITA. No modification to this provision shall be effective unless it is in writing, on paper, and signed in ink by authorized representatives of each party.~~

3.3.2 Confidentiality (Systems Integrator)

The Systems Integrator assures that information and data obtained as to personal facts and circumstances related to data subjects will be collected and held confidential, during and following the term of this agreement, and will not be divulged without the individual's and the agency's written consent. Any information to be disclosed, except to the agency, must be in summary, statistical, or other form which does not identify particular individuals.

3.3.3 Latest Software Version

Any software product(s) provided under the contract shall be the latest version available to the general public as of the due date of this solicitation.

A. Command Units

Command Units are full featured, public safety grade portable or mobile radios. These units typically provide features such as keypad, illuminated display, automatic telephone interconnect, encryption, private or single unit calling, meets portions of MIL-STD- 810, and access to groups or subgroups necessary for administrative functions. Command Units are typically assigned to administrative, command, front line supervisory or management personnel.

B. Staff Units

Staff Units are public safety grade portable or mobile radios as described above, but include only those features necessary for fulfilling the particular mission of a public safety or public service agency. The feature set is more limited than the feature set for the Command Units. These units typically provide the groups or subgroups necessary for routine operation, with the capability of being dynamically regrouped as required. Staff Units are typically assigned to staff or field level public safety and public service personnel.

C. Analog Units

Analog Units are economically priced non-public safety grade portable and mobile radios. These will only operate on analog talk groups and may be limited in the number of talk groups available. The emphasis is on cost control through reduction in features. Analog Units are typically assigned to non-sworn personnel.

Radio Tiers

It is expected that Command and Staff Tier Units will be the same RF model, with the only differences being equipped features or options, and price.

It is desired that these two tiers be from the same family of radios. The intent is to allow the same model/type of accessories, such as microphone, antenna, or battery, to work on ~~all two~~**both** tiers of the radio.

4.3 System Responsibility

The SI shall be responsible for verifying the completeness and suitability of all work or equipment proposed for this system. COV also expects that the SI, even if not specifically mentioned herein, shall provide any additional equipment or labor required in order to meet these Specifications, without claim for additional payment, it being understood that a complete operating system is required.

Further, the SI shall be responsible for the design, furnishing, and installation of all required interfaces with existing systems and equipment, as well as such interfaces that might be specified in the system specification, unless such interfaces are specifically excluded or ascribed to others in this specification. The SI shall be obligated to obtain or manufacture, provide and install a system, which meets all guarantees in the Proposal for the price contained therein. The SI must adhere to COV agreements with the National Radio Astronomy Observatory (NRAO) concerning system coverage**, which are reflected in the current radio frequency authorizations**. **The NARO has not reported any interference that the current transmitter sites have caused. Additional sites or modifications to existing radio frequency authorizations requires the concurrence of the NRAQ.**

4.4 Environmental Requirements

In general, COV desires that equipment be designed to operate within the specifications described in Table 4-1.

4.4.1 Non-Ionizing Electromagnetic Radiation Restrictions

All sites whether existing or proposed shall be designed, protected and posted by the SI to limit exposure to Electromagnetic Emissions (EME) in accordance with **47 CFR,** Federal Communications Commissions (FCC) **OET (office of Engineering and Technology)** Bulletin ~~OET~~ 65 (Appendix D or most recent regulation adopted by the FCC), the Federal Communications Commissions exposure to Radio Frequency Electromagnetic Emissions (RF EME), and the Commonwealth of Virginia (COV) RF Radiation Exposure Compliance Plan (refer to Appendix K).

All general public areas where the individuals are not aware of potential exposure and including occupational areas where the individuals are aware of and have control potential exposure to EME from existing or proposed antennas will receive documented training appropriate to their potential level of exposure or the access shall be strictly limited.

~~COV desires that the~~ SI **shall** certify compliance with **47 CFR,** the Federal Communications Commissions (FCC) **OET** Bulletin ~~OET~~ 65 (Appendix D or most recent regulation adopted by the FCC), the Federal Communications Commissions exposure to Radio Frequency Electromagnetic Emissions (RF EME), and the Commonwealth of Virginia (COV) RF Radiation Exposure Compliance Plan. RF exposure limits at each site and mobile vehicle, portable and special equipment shall be evaluated (detailed information on evaluating such devices can be found in NCRP report No.119). Therefore, a paper study of the electromagnetic emissions produced by any or all of the antennas mounted thereon is expected to be conducted by the SI. COV desires that once the SI performs the study, it be verified and sealed by a professional engineer familiar with non-ionizing electromagnetic radiation. The report will be submitted to the COV Project Manager and the Engineer at least sixty (60) days prior to the commencement of any Acceptance Testing. The Engineer will review all site EME studies to establish compliance with the Maximum Permissible Exposure (MPE) requirements of the **47 CFR,** FCC Bulletin OET-65, the Federal Communications Commissions exposure to Radio Frequency Electromagnetic Emissions (RF EME), and the Commonwealth of Virginia (COV) RF Radiation Exposure Compliance Plan.

The SI's study shall define the total radiation levels possible based on both the proposed and existing antennas at the site. The SI's study should determine that the expected levels are within the MPE levels as specified in the FCC Bulletin OET-65, the FCC Exposure to Radio Frequency Electromagnetic Emissions (RF EME), and the COV RF Radiation Exposure Compliance Plan.

Should the study establish that the expected levels exceed the MPE, the SI ~~is expected to~~**shall** be responsible for bringing the site into compliance at no additional cost to the COV.

Under no circumstances shall the levels outside of the site boundaries (i.e. - site fenced area) exceed the ~~minimum exposure~~ **MPE** levels for public exposure.

As part of "turn-key" services, the SI shall be expected to provide the services necessary to determine their equipment's compliance to EME emission levels as stated in FCC Bulletin OET-65, the FCC Exposure to Radio Frequency Electromagnetic Emissions (RF EME), and the COV RF Radiation Exposure Compliance Plan.

It is the COV's position that the SI has an obligation to ensure that the equipment design and installation is done in a manner that will ensure compliance with the aforementioned regulations. The Commonwealth of Virginia is aware that the overall compliance with these regulations is their responsibility. However, the SI is expected to provide the COV Project Manager and the Engineer with adequate paper study/studies required to make a suitable determination about compliance.

The SI is responsible for posting all required signs for identification of the various threats of exposure. Posting of required signs by the SI will be done only after the COV Project Manager's review and approval. COV desires that the SI, to the extent reasonably possible, restrict access to areas where the exposure levels warrant such actions **and make allowances for the COV to turn-off transmitters at each site to allow its personnel to safely climb towers**.

4.5 Standards (EIA, FCC, etc)

The Offeror is expected to comply with the Standards and referenced documents of this Specification in the design, manufacture, and implementation of all applicable aspects of this system. In the event of any conflict between these Standards and referenced documents in Sections 1-13 of this Specification, said conflict shall be resolved in favor of Sections 1-13 of the Specification. Should the Offeror take exception to anything contained in the referenced Standards, documents or Specification Appendices, the Offeror shall provide a complete and detailed description of the exception. Blanket exceptions shall not be allowed.

The equipment shall meet or exceed all current EIA (Electronics Industries Association) and FCC (Federal Communications Commission) standards and regulations applicable to the particular class of equipment proposed. The necessary FCC Type Acceptance shall be obtained prior to delivery. In addition, no radio equipment will be ordered by COV without Commonwealth possession of the associated Radio Station Authorizations issued by the FCC.

The following standards, codes, and regulations shall apply, at the appropriate revision level in use as of the Proposal due date, unless a specific revision is referenced:

FCC 47 CFR Rules and Regulations

OSHA Occupational Safety and Health Administration Recommendations

- Causes loss of functionality of any entire site.
- Causes simultaneous loss of 25% of the radio channels in any subsystem.
- Causes failure of all console positions at any communications center.
- Causes loss of the ability to report alarms, or any alarms that might indicate a catastrophic failure or the switchover from primary to backup equipment.
- Causes failure of the alarm system to display an alarm condition as identified in the "System Alarms and Diagnostics" section of the Specifications to the operator within thirty minutes after the condition occurs.
- Causes loss of multi-site controls or networking.
- Causes loss of simulcast capabilities.
- Causes loss of trunking capabilities for any reason.
- Degrades non-critical subsystem features and goes uncorrected for longer than the SI response times for non-catastrophic failures as herein specified.

4.9 Maintenance, Warranty and Warranty Support Minimums

SI Responsibility: COV desires that the system described herein which includes the LMR, Microwave, Mobile Data and Intranet be the total responsibility of the SI prior to any project phase system acceptance, and with warranty service ~~for one year~~ following that acceptance. For Scenario 1, COV will have the responsibility to provide field and depot level maintenance and repair. **During the warranty period, the COV technicians will send malfunctioning subscriber equipment to the SI for repair and will assist the SI's technicians with troubleshooting infrastructure related items.** For Scenario 2, COV desires that the SI have responsibility covering maintenance and repair, including all related labor and costs, of the installed system. The Offeror shall state in the Proposal the name, address, and capabilities of the service station(s) providing warranty service. It is highly desired that the SI service stations be centrally located within **at least eight**~~applicable~~ service areas.

The Offeror shall identify in their proposal for each service station(s) their experience with wide area (City, County or Statewide) digital radio system installation, operation and maintenance **(similar to and exact items being proposed)**. Under Scenario 2 hardware configuration, spares, software, firmware, passwords, network access, documentation and encryption keys shall be under strictest control of the SI. The Offeror shall describe in their proposal the methodology of this control.

Disaster Recovery Transportable Sites, Transportable LMR Sites, and Command Posts are to be considered fixed infrastructure assets when maintenance and warranty is considered.

4.9.1 Warranty Service (New Equipments and System Performance) **(For Scenario 1)**

It is anticipated that the COV will perform equipment troubleshooting/ investigations, replacement of ~~fixed and~~ non-fixed equipment **and assist the SI's technicians with fixed equipment** during the warranty periods. Replacement of fixed and non-fixed equipment will be done at the lowest replaceable unit (LRU). COV therefore desires that warranty service on new equipments, modules, and sub-modules, software, and all system performance following any project phase system acceptance be on the following basis:

A. Equipment and Parts: For 12 months, in whole and in part, all system hardware, parts and materials including handling, return and delivery charges and fees at no cost to the COV**; with the exception of MDT equipment, which shall be 36 months.**

B. Labor: For 12 months, in whole and in part, all labor associated with warranty service at no cost to the COV**; with the exception of MDT equipment, which shall be 36 months**.

C. The Offeror should separately price in their proposals (as a minimum), test equipment, standard and custom test figures, repair machines, depot spares, training (all electronic equipment and software), manuals, documentation (to the component level), etc. required by the COV to set up a COV **field and** depot level maintenance and repair facilit**ies**~~y~~.

D. Software: COV desires that software associated with system features, functions, and capacity as required by this specification be warranted for a period of 12 months from final system acceptance. During the installation and warranty periods, COV desires that the SI provide, at no additional cost, ~~commercially available~~ upgrades of any and all software sold to the

COV as part of the turnkey installation. The frequency and timing of installation of upgrades during this period will be at the sole discretion of the COV based on availability by the SI.

Software subscriptions for all equipment **after the warranty period** is **highly desired**~~preferred~~ by COV.

This covers only upgrades by the SI or Original Equipment Manufacturer or Original Software Vendor that are: 1) patches for defective software; 2) new releases that are corrective revisions for earlier versions and/or; 3) no-cost enhancements to earlier releases. New software releases that contain enhancements (i.e., new features and capabilities) will be purchased **in accordance with the Virginia Public Procurement Act (VPPA)**~~at COV approved prices~~.

The SI should make every effort to separate corrective revisions from enhancements. If the SI is unable to do so, and new releases are necessary to correct problem(s), COV desires that the entire release (including enhancements) be provided to the Commonwealth at no additional expense. Independent of scenario or financing agreement, new software shall not be installed that leads to the necessity of a hardware upgrade without the previous concurrence of the COV Project Manager.

COV desires that all back-up CD-ROM's**, DVD's (floppy diskettes are not acceptable)** and revised software manuals will also be provided to the COV at no extra cost at the time of any software revisions. COV desires that if deemed necessary by the COV, software upgrades be performed by the SI during evenings or weekends at no expense to the COV **and after obtaining the concurrence of the COV Project Manager**.

COV desires that all software releases for all program controlled devices be brought to the same release level prior to the conclusion of the warranty period and at the conclusion of the entire project.

COV desires that all system definition parameters and other unique information (data sets) used to operate the mobile radio system or any associated sub-system included in this turnkey project be backed-up onto removable high capacity media such as CD or DVD (utilizing standard protocols that are available from more than two sources) on a quarterly basis during the installation and warranty period by the SI at no cost to the COV. COV desires that these CD's or DVD's be turned over to COV Project Manager for safe, off-site storage. COV desires that the backup be designed to run in an unattended mode with no requirement to change disks or tapes during the process.

COV **highly** desires that any notices either generated and circulated internally by the SI or received by the SI from the original Software Provider, alerting the SI to software problems found elsewhere, be passed onto the COV Project Manager within thirty (30) days of receipt of such material.

All conditions above also apply to all firmware installed in any products included as part of this turnkey system.

4.9.2 Warranty Response

During the one-year warranty period **under Scenario 1 (with the exception of MDT equipment, which shall be 36 months)**, malfunctioning mobile and portable units will be provided by COV'S personnel for exchange by the SI. COV desires that the SI state the method for handling and the turn-around-time for the repair of mobile and portable radios during the warranty period **for both Scenarios**.

Under Scenario 2, the COV desires that the SI have a qualified technician available to respond to the location of catastrophic failures within 1 hour during normal working hours (8 AM to 5 PM weekdays), and within 1.5 hours at other times. Catastrophic failures not caused by outside effects from acts of god (such as but not limited to lightning damage to equipment, facilities, enclosed antenna subsystems, etc.) are expected to be resolved within 2 hours after arrival of the technician.

In addition, Catastrophic failures caused by outside effects from acts of god affecting LMR, Mobile Data and Microwave antenna system operation and alignment are expected to be resolved within 12 hours after arrival of the technician.

It is recognized by COV and SI that certain catastrophic failures may occur as a result of extraordinary multiple and/or sequential failures of individual parts, systems, or components, or as a result of secondary events (e.g., fire) which are beyond the reasonable control of the SI. In any situation, the SI shall send adequate SI technical and/or service personnel to the site to reside on-scene until the situation is resolved.

In such instances, where specially fabricated parts or components will be required to repair the system, or where necessary repairs clearly exceed those which are reasonably considered as "field repairs", the SI will not be required to make necessary repairs within the 2 hour time frame noted above. **However, an interim solution to restore communications shall be employed until a repair can be implemented.** The SI ~~is required to~~**shall** meet with the COV Project Manager or representative within that time frame however, to reach a mutually agreeable timetable for both interim repairs and total system restoration.

For Scenarios 1 and 2, the COV desires that the SI have a qualified technician available to respond to the location of non-catastrophic infrastructure (with the exception of units with hot-standbys)~~ or command post~~ malfunctions within 2 hours at all times. For each occurrence that the SI cannot meet the above criteria for any reason, the SI **shall** provide~~s~~ legal remedy for that month, to be the cost associated with the non-discounted average monthly value of the first year of maintenance for all the project phases. COV desires that this may be either an extension of warranty or the cost value, at the option of the COV. COV desires that each extension of the warranty period be cumulative and no extensions so required run concurrently.

The legal remedy described in the preceding paragraph applies only to the failed equipment in the case of non-catastrophic failures. However, COV desires that if the failure is catastrophic (as defined herein) and the SI fails to respond within the specified time frame, the legal remedy described in the preceding paragraph applies to the entire system. COV desires that the legal remedy for the entire system be limited to four occurrences of failing to meet the response times for catastrophic failures for the entire project. On the fifth occurrence, the SI may be deemed to be in default, and the COV may, at its option, enforce the default provisions of the contract.

COV desires that response times be the same during the ninety (90) day Commonwealth Review period and each thirty (30) day performance test period.

4.9.3 Equipment Failures

If a fixed equipment module or a non-fixed unit (or control head if applicable) fails more than twice during any acceptance test or twice during it's applicable one year warranty period, the SI shall meet with the COV to discuss and explain such failures.

If, in the opinion of the COV, these failures indicate that the equipment is potentially prone to continuing failures, COV desires that the SI replace **it or the entire lot if multiple units are involved**~~it~~ at no cost to the Commonwealth **(including installation)**.

4.9.4 Preventive Maintenance

In addition, COV desires that during the warranty period**s**, the SI **shall assist the COV to** provide routine preventive maintenance of the infrastructure on a regular basis, including (but not limited to): system alignment verification (monthly), battery systems and fixed transmitter and receiver alignment verification (6 month intervals). The COV desires that COV repair and maintenance personnel accompany SI service personnel performing routine infrastructure preventive maintenance in order to obtain on-the-job preventive maintenance training. ~~COV also desires to provide routine preventive maintenance of the infrastructure on a regular basis during the warranty periods.~~

The Offeror shall describe in their proposal under what conditions will the COV be allowed to provide warranty period preventive maintenance services, potential costs incurred, and potential cost savings for the COV. The Offeror shall describe in their proposal the preventive maintenance routines and programs for major infrastructure equipment especially battery systems, systems prone to lightning (such as antenna subsystems components, computer processor equipment, etc.) and equipment exposed to outside environmental elements. The Offeror shall also describe in their proposal preventive maintenance processes and procedures for towers, portable radio and MCT batteries.

COV desires that maintenance standards described in the next section be adhered to for all maintenance performed during the warranty period.

4.9.5 Maintenance Standards

~~During each project phase warranty period, maintenance will be handled by the COV (Scenario 1) or by the SI (Scenario 2).~~ The following maintenance standards apply to SI provided ~~**(scenario 2)**~~ maintenance after the warranty period **(Scenario 2)**.

A. COV desires that the approach to maintenance of this system be preventive maintenance as briefly described in Section 4.9.4 above.

In addition to preventive maintenance, it is expected in a system of this nature that following cutover to the COV, some system ~~optimization and~~ adjustment**s** ~~will~~**may** be required. COV desires that all work of this nature be coordinated through and with the COV Project Manager.

B. The minimum replacement parts standards shall be equal in quality and rating to the original parts.

C. The equipment shall be maintained in a clean condition. Oil, dust and other foreign substances are to be removed on a routine basis.

D. The equipment and system performance shall be maintained at the level initially described in these equipment and systems specifications and the service organization's maintenance records shall be kept to confirm that this has been done.

Records shall be provided periodically to the COV and be available for COV's inspection upon request. COV desires that records be maintained by the SI's radio maintenance shop throughout the warranty period (and any subsequent maintenance contract period), and revert to the COV upon termination of the warranty (or maintenance contract). **It is desired that these records be in electronic format such as MS Word or MS Access and stored on the STARS project server to be accessible through the STARS Intranet.**

E. That routine maintenance procedures recommended by the equipment manufacturer be followed. The manufacturer's acceptance test be used after an item has been repaired.

F. That the SI shall provide only factory trained and authorized maintenance personnel.

G. That the SI service organization(s) must maintain comprehensive installation and instruction manuals for all systems equipment. COV desires that these manuals be the property of the Commonwealth, and revert to COV at such time as the Commonwealth assumes the maintenance responsibility for the system.

H. COV desires that maintenance of non-fixed equipment be on a unit replacement basis, such that the amount of time Users spend in the maintenance shop be minimized. COV desires that for systems with multiple subsystems, maintenance facilities for non-fixed equipment be located within the boundaries of each subsystem area. For COV **sworn officers**~~public safety agencies~~ (such as but not limited to Virginia State Police, Marine Resource Commission, Capital Police) COV desires that SI maintenance personnel go to the location where the **officer's**~~public safety~~ non-fixed equipment normally is headquartered at the lowest level. Non-**sworn user's** ~~public safety agency~~ maintenance will go to one of the SI service centers**.** ~~or a COV service center (if the COV is performing maintenance services).~~ Offerors shall include their maintenance shop locations in their Proposal. At least eight (8) **equipped and staffed maintenance** shops should be evenly divided throughout the COV.

I. Offerors shall describe their proposed escalation procedures to be used in the event COV demonstrates problems are not being resolved within an adequate timeframe.

J. COV desires that the SI provide documentation of all system maintenance performed to COV Project Manager by the fifth (5^{th}) day of each month detailing the previous month's work. This report will include all repairs or exchanges on all fixed or non-fixed equipment. COV desires that the report also include a list of all units repaired and the time required and cost of repairs and all units exchanged. The report will also include a list of any repairs pending and their current status.

K. Maintenance personnel involved with aircraft and marine radios shall have the proper licenses.

4.9.6 Hardware Maintenance Contract

COV desires that all Hardware equipment of Project Phases I-III be brought (retrofit/upgrade) to the same Phase IV release level prior to final system acceptance (refer to Table 4-2D).

It is the intent of the COV, in Scenario 1, to perform maintenance and repair services.

The Offeror should explain in their proposal what is required and what is included in their proposal offering for this important COV project repair and maintenance requirement. Equipment/boards that are not economical for the manufacturer to repair should be identified and excluded. Copies of documentation should be provided for eight (8) field repair locations and multiple copies at the Richmond depot repair facility. It is highly desired to have both soft and hard copies for all documentation.

As an option (Scenario 1), COV desires that the Offeror propose separate one-year hardware SI maintenance contracts for each LMR, Microwave, Mobile Data ~~(3 years)~~ and Intranet~~. component not directly manufactured by any member of the SI team contained in the Proposal. COV desires that these maintenance contracts take effect immediately following the expiration of the warranty period. It is the intent of this paragraph to obtain maintenance quotations on those items that are not directly related to the normal radio shop maintenance articles. The items to be included under these separate maintenance quotations include, but are not limited to, items manufactured by DEC, IBM and other similar items.~~

~~COV also desires that t~~**T**he Offeror **shall** propose, as an option (Scenario 1), a maintenance contract for the system fixed equipment and non-fixed equipment~~, that maintenance contract to take effect immediately following the expiration of the warranty period, and~~ to be renewable on a yearly basis. ~~COV desires that this~~**The** system maintenance contract **is to** be based on the initial system configuration for fixed equipment and on a per unit/per year basis for non-fixed equipment. ~~COV desires that t~~**T**he Maintenance Contract **shall** include preventive maintenance for the infrastructure. Preventive maintenance may be a separately priced line item.

4.9.7 Software Maintenance Contract

~~COV desires that t~~**T**he Offeror **shall** propose, as an option (Scenario 1), a software maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis.

During the software maintenance contract period, COV ~~desires that~~ the SI **shall** provide at no additional cost, periodic upgrades of any and all system operational software.

The frequency and timing of these upgrades during this period will be at the sole discretion of the COV. This covers only upgrades by the SI or Original Equipment Manufacturer or Original Software Vendor that are: 1) patches for defective software; 2) new releases that are corrective revisions for earlier versions and/or; 3) no-cost enhancements to earlier releases. New software releases that contain enhancements (i.e., new features and capabilities) will be purchased ~~at COV approved prices~~**in accordance with the VPPA**.

The SI should make every effort to separate corrective revisions from enhancements. If the SI is unable to do so, and new releases are necessary to correct problem(s), COV desires that the entire release (including enhancements) be provided to the COV at no additional expense. Independent of scenario or financing agreement, new software shall not be installed that leads to the necessity of a hardware upgrade without the previous concurrence of the COV Project Manager.

COV expects that all back-up DVD's or CD-ROM's and revised software manuals also be provided to the COV at no extra cost at the time of any software revisions. COV desires that if deemed necessary by the COV, software upgrades be performed by the SI during evenings or weekends at no expense to the COV.

COV desires that all software releases for all program controlled devices be brought to the same release level prior to the conclusion of the maintenance period. COV desires that all system definition parameters and other unique information (data sets) used to operate the mobile radio system or any associated sub-system included be backed-up onto CD's or DVD's on a quarterly basis during the maintenance period by the SI at no cost to the COV. COV desires that these CD's or DVD's be turned over to the COV for safe, off-site storage.

COV desires that any notices either generated and circulated internally by the SI or received by the SI from the original Software Provider, alerting the SI to software problems found elsewhere, be passed onto the COV Project Manager within thirty (30) days of receipt of such material. All conditions above also apply to all firmware installed in any products included as part of this system.

Any annual software license fees or software maintenance fees should be clearly identified in the Offerors response and should either be rolled into this software

maintenance contract fee or paid in full as part of the initial turnkey system pricing

COV desires that the Offeror provide, as an option (Scenario 1), a software support package that provides periodic non-corrective upgrades that enhance the proposed software package. COV desires that this package be separate from the corrective software support required as part of the Maintenance Contract and specified in this paragraph. Software shall not be added to any part of the network or subscribers that causes the need to change or purchase additional or replacement hardware without the previous concurrence of the COV Project Manager.

4.9.8 Latent Feature Activation

The SI shall honor and not diminish any part of the original design specifications for any expansion or feature set that was part of the contract, and that might be activated in the future, at no cost to the COV. ~~COV desires that s~~**S**ystem malfunctions due to both hardware and software **shall** be corrected at no cost to the COV.

4.9.9 Spare Parts

COV desires that spare parts be handled on a rolling repair-and-return basis. It is also desirable that sufficient numbers and types of spares be provided to the COV by the SI to implement this approach. The maintenance service centers and maintenance personnel may draw upon this spares inventory as necessary during the warranty/maintenance periods, replacing those used on an as used basis. Spares from the smallest replaceable board to non-standard items to complete units are to be included. It is anticipated that COV vehicles (29 maintenance service, 4 tower maintenance crews, 3 equipment installation crews, 8 regional service centers and a depot center) need sufficient spares to perform their required maintenance responsibilities (Scenario 1) and response time and for disaster recovery and emergency network reconfigurations.

COV also desires that the spares complement include sufficient non-fixed units to enable maintenance on a unit replacement basis. The Offerors should provide in their proposal a complete listing of proposed spare parts, including spare part name, applicable fixed or non-fixed equipment name the spare is part of, total number of applicable equipment units serviced by this spare part, spare part quantity, price and anticipated spare part storage location(s).

COV desires that at the end of each project phase warranty or maintenance period (a Scenario 1 option), the full complement of applicable spares be delivered to the COV in a repaired condition. At a minimum, the greater of five (5) units or two percent (2%) of the total number of each different mobile radio tier, package, model, or type including control head if applicable, the greater of five (5) units or two percent (2%) of the total number of each different portable radio tier, package, model, or type, and the greater of five (5) units or two percent (2%) of the total number of each different MCT tier, package, model, or type be supplied as part of the spares complement. The spare portable units are not required to include a spare battery.

Further, COV desires that if during the one (1) year warranty periods more than 5% of repair and returns are not completed in ten (10) days or less, the **s**pares inventory counts be doubled at no additional expense to the COV. COV desires that these additional spares also be delivered to the COV as specified above. The purpose of this requirement is to ensure that adequate quantities of available spares are maintained on the shelf.

The Offerors shall provide costing in their proposal for a complete set of boards for all proposed fixed equipment. Additionally, COV desires that Offerors suggest which of the listed boards are deemed necessary to ensure the reliable operation and rapid restoration of the system.

4.10 SI Support

The SI shall ~~be expected to~~ provide support for the life of the system and technologies (20 years from notice to proceed of Phase I) in the areas of service, modernization, and updating at minimum cost to the Commonwealth. In this regard, COV desires that "support" be considered to include professional and timely service in the repair, maintenance, and modifications of the system during Warranty; immediate availability and provision of new parts, materials and equipment beyond that specified herein; service and design/engineering counsel following Warranty for the life of the system; and any such response as is customary and expected of a service-oriented business. The Offerors shall address this issue in the Proposal, describing also the mechanisms for reporting the availability of upgrades and for procuring and implementing those upgrades.

COV expects that the SI have the capacity and resources to support the COV's Project Manager and the Engineer's project responsibilities in addition to the required SI resources manage, engineer, manufacture, construct, install and test.

4.11 Installation Responsibilities

4.11.1 General

The communications equipment and required Physical Facilities shall be installed/contracted by the SI in a neat and professional manner, employing the highest standard of workmanship and in compliance with the National Electrical Code (NEC), Electronic Industry Association (EIA) standards, Federal Aviation Administration (FAA) standards, applicable building codes, COV building requirements, and applicable FCC standards and procedures. The result of the installation/construction shall be an operating communications system.

In Scenario 1, the SI shall (through the COV Project Manager) obtain the necessary permits from the appropriate COV agencies.

4.11.2 Commonwealth Responsibilities

A. Provide coordination as required gaining access to the proper areas of the COV'S property.

B. Installation, warranty and maintenance services at the existing **View Tree (**Warrenton **Training Center)** microwave site and the Quantico LMR/microwave site will done by VSP technical staff personnel.

4.11.3 SI's Responsibilities:

Except as specifically described under "Commonwealth's Responsibilities" above, the SI shall:

A. Furnish, install, and test all proposed fixed equipment, including all materials necessary for installation.

B. Furnish and install all power, audio, control, and radio transmission cables connecting SI supplied equipment to the power panels or receptacles and the audio/control line connection box. The SI shall provide building penetrations, where required, for all cables and lines.

1. Provide 240/120 VAC building wiring, and any backup power necessary, including surge protection and grounding at the power entrance location.

2. Route audio/control lines to a panel or box in the vicinity of the equipment installation.

C. Assist COV in timing the installation of the necessary COV leased telephone circuits (Scenario 1).

D. Provide vehicle bays for each phase at various locations suitable for installation of vehicular equipment and installation staging by the SI.

E. Install all new vehicular equipment including mobile units, vehicular chargers, vehicular repeaters, RF power amplifiers (if provided) and the required accessories. COV desires that installation responsibilities include the removal and COV approved ~~deposition~~**disposition** of existing equipment after System Cutover.

F. Furnish and deliver all new portable equipment to the location/personnel designated by the COV.

G. Furnish and install all Physical Facilities required for a complete system (includes site preparation and development, fencing, equipment buildings or enclosures, microwave and radio towers, emergency generator and site power systems, grounding systems, etc.).

H. Ground all equipment as specified in Appendix C, and by any applicable codes. This includes the provision of control line and power line surge protection equipment, antenna and transmission line grounding, and equipment grounding.

I. Seal all penetrations of building floors and walls with silicone sealant to make the penetrations waterproof, rodent-proof and insect-proof. The SI shall install all cables that penetrate the building such that the lowest point of the cable run is a minimum of six (6) inches below the penetration forming a drip loop to prevent water from following the lines into the building.

J. Provide final detailed and dimensioned floor plans and layout drawings depicting the proposed installations at the various sites. At the same time, the SI shall also provide design data about the equipment at each site including weight, heat dissipation and electrical load on the backup power system. The SI shall provide this information to the COV Project Manager and the Engineer for approval within forty-five (45) days of Notice to proceed so that the specifications for the remaining Physical Facilities may be prepared.

K. Provide finished as-built drawings as part of the system documentation. Such drawings shall be provided to the COV Project Manager and the Engineer in both hard and soft copy.

L. Leave all sites in a neat, presentable condition throughout the installation phase of the project. The SI shall remove all rubbish, temporary structures, and equipment (to the extent of that generated or used by the SI in this implementation) after completion of the work, and prior to acceptance.

M. For all new tower installations, provide documentation verifying that the new tower (including installed antenna systems) does not modify the pattern of existing broadcast antennas.

N. For all new antenna installation on new or existing towers, provide documentation verifying that the antennas does not modify the pattern of existing co-located site antennas. **As a minimum the SI shall perform a paper study to verify that the new antenna installations do not modify co-located site antenna patterns.**

O. For the implementation and management of inventorying of all equipment, including spare parts, test equipment, etc. and project documentation for the duration of the project.

The COV through the Engineer will establish a control process and database for inventorying new equipment and documents. The Engineer will define the items to be inventoried and the procedure for entering the items into the inventory control process. COV desires that the SI use barcode equipment labeling for inventorying control purposes. **Further, the Systems Integrator is expected to perform a receiving inspection of new hardware and physically inventory the units. Receipt testing is limited to a power-on test, log-on script initiation, and one data query. The SI shall submit to the Engineer and COV the installation procedures in accordance with manufacturer recommendations, for COV approval.**

In addition to the SI's responsibilities listed above, specific LMR, Microwave, Mobile Data and Intranet system and physical facilities responsibilities are also listed in Sections 6 – 12 of this document.

4.11.4 Grounding and Surge Protection

SI's strict compliance with specified lightning and surge protection practices are required at all sites at which fixed equipment is installed with the SI following the practices outlined in the GROUNDING & SURGE PROTECTION FOR THE COMMONWEALTH OF VIRGINIA COMMUNICATIONS SYSTEM contained in APPENDIX C.

The Offeror shall comply with the Standards and referenced documents of this Specification in the design, manufacture, and implementation of all applicable aspects of this system. In the event of any conflict between these Standards and referenced documents in Sections 1-13 of this Specification, said conflict shall be resolved in favor of Sections 1-13 of the Specification. Should the Offeror take exception to anything contained in the referenced Standards, documents or Specification Appendices, the Offeror shall provide a complete and detailed description of the exception. Blanket exceptions shall not be allowed.

The Site Ground to be designed by the SI to provide resistance to ground that does not exceed five (5) ohms.

A plan for implementation of the lightning and surge protection measures shall be prepared by the SI, and submitted to COV Project Manager and the Engineer within ninety (90) days after Notice to Proceed of each Phase.

4.11.5 LMR/Mobile Data/Microwave Antenna Systems

COV considers it essential to establish a formal transmittal process for documentation and correspondence control, to be used by all organizations that are part of this turnkey project. Early in this turnkey project, the Engineer will establish a transmittal system for project documentation (both e-mail and hard copy) and correspondence. COV desires that all project participants and organizations utilize the transmittal process for documentation and correspondence control established by the Engineer for this project for both hard copies and soft copies of documentation. The primary means of communication shall be email with a hard copy backup.

4.14 Permits and Licenses

COV desires that the SI provide assistance necessary to the Engineer in **tower and** frequency acquisition. COV also desires that the SI provide assistance necessary in preparing FCC license transfer documents. **The SI shall prepare all FAA documentation for notification of new tower construction.** The COV, with the Engineer's assistance, will obtain necessary **FAA approval and** FCC licenses. If it becomes necessary to modify **FAA or FCC**~~the~~ license application**s** because of changes in the system configuration made to accommodate the SI, any additional coordination**,** or **FAA/**FCC fees required or Commonwealth costs incurred shall be the responsibility of the SI.

The SI shall be responsible for obtaining any applicable local, state, or federal permits, licenses and approvals necessary to prosecute the implementation of this project, including but not necessarily limited to, zoning, environmental, land use, and construction permits or approvals. Federal and state permits shall be submitted through the COV Project Manager.

~~COV desires that it be t~~**T**he SI~~'s responsibility to~~ ~~-~~**shall** coordinate installation of all leased telephone circuits. ~~COV desires that it be t~~**T**he COV~~'S responsibility to~~ **will** arrange for those circuits and pay for associated costs. COV desires that Offerors include all leased line non-recurring and recurring costs in their Proposal and itemize these costs in the price pages.

4.15 System Engineering

The SI shall be responsible for the detailed design of the LMR, Microwave, Mobile Data and Intranet equipment and systems.

The SI shall design these systems to the functional and performance level according to the technologies that the SI has established as their prime technologies. The SI design services shall also include all services necessary to implement this turnkey system and project.

The SI shall be responsible to develop the detailed site specific system and coverage designs, site designs, each LMR subsystem design, microwave infrastructure design, mobile data and Intranet subsystem designs, LMR simulcast design, system availability, reliability, survivability and maintainability design, and equipment and system alarm designs.

The SI shall be responsible to conduct **detailed** design reviews in accordance with contract requirements and the project schedule. **Upon approval of the detailed design, the COV will provide the SI a notice to proceed. No work shall commence until this notice to proceed is provided by COV.**

COV desires that the SI be responsible for any loss or damage to property caused by ~~his~~ **its** operations or personnel. Damages will be settled with the COV ~~of the property~~ by the SI in the company of an agent of the COV. COV desires that the SI submit a signed damage release document, for all sites concerned, before the final payment will be made by the COV.

4.16 Implementation Project Management

4.16.1 Project Management

A. Implementation Project Manager

A single person shall be designated by the SI as SI Implementation Project Manager to be the primary source of contact between the COV Project Manager and the Engineer and the SI. The SI Implementation Project Manager shall bear full responsibility for supervising and coordinating the design, shipping, installation, optimization, testing, acceptance, cutover and migration of the turnkey project. The SI Implementation Project Manager should be certified as a Project Management Professional (PMP) by the Project Management Institute. All inquiries about the project are xpected to be directed to the SI Implementation Project Manager.

Within fifteen (15) working days after execution of the contract, the SI shall advise COV of the name, address, and office and home telephone numbers of the SI's designated Implementation Project Manager. Any changes in the SI's designated Implementation Project Manager shall be made only with prior written approval by the COV Project Manager.

COV desires that the SI establish a Richmond field office at least one (1) month before the start of installation activities of Project Phase I. The office will be the headquarters of the assigned SI Project Installation Supervisor and used by other SI project personnel as required. The field office should be maintained throughout the project duration. It is highly desired that the SI's Project Manager (resume provided in this proposal) shall be assigned to the Richmond Office.

B. Implementation Project Team

The SI's Implementation Project Manager and the SI's Implementation Project Team ~~will~~ **shall** coordinate with the COV Project Manager and the Engineer to implement the overall project schedule in accordance with the contract and the specification requirements. Resources to be managed include (but not limited to): staging facilities, sub-contractors, other vendors, and service shop personnel. The SI's Implementation Project Team ~~is expected to~~**shall** operate under the direction of the SI's Implementation Project Manager to coordinate activities so that every aspect of the project is implemented in an efficient and effective manner according to the project milestones. It is expected that the SI notify the COV Project Manager and the Engineer thirty (30) days in advance of any site visits, inspections, tests, and on-site meetings.

The SI Implementation Project Manager and Implementation Project Team is expected to be involved (for the duration of the project) in on-site meetings and project review meetings and be available for project coordination meetings in Richmond or teleconference meetings (with the COV Project Manager and the Engineer) that most likely will be held bi-weekly but could be held during critical stages of the project on a weekly basis. **The on-site meetings will be organized by the Engineer at a facility provided by the SI. It is assumed that approximately four meetings per installation site will be required.**

The COV Project Manager and the Engineer will be maintaining a master project budget for each phase of the project. The SI ~~is expected to~~**shall** participate in this process ~~in a timely fashion as required by the~~ **responding with two days at the direction of the** COV Project Manager. COV will define and identify project and implementation budget items and how they relate to the master project tasks, deliverables including payment terms and conditions. The master project budget will include at a minimum, all SI's infrastructure upgrade, facilities, and equipment costs. The COV Project Manager, the Engineer and the SI ~~will~~ **shall** work together to identify a list of updates or changes, which will be incorporated in the master project budget initial version and subsequent updated master project budget versions for the duration of the project.

C. Project System Engineer

The SI's Project System Engineer shall be responsible for ensuring that the installation is performed to COV's contract specification requirements, standards and practices. The SI Project Engineer shall manage the technical content of the system installation and test acceptance procedures for commissioning the system. The SI Project System Engineer ~~is expected to~~**shall** monitor all technical activities, from factory manufacture to field acceptance testing.

4.16.2 On-site Construction Management

A. Project Installation Supervisor

The SI Project Installation Supervisor is a SI employee who will assist the SI Project Manager and SI Project System Engineer during the on-site construction and installation phases of the project. This individual ~~will~~**shall** report all aspects of the project installation to the SI Project Manager, the COV Project Manager, the Engineer and the appropriate installation and service shop personnel. The SI Project Installation Supervisor ~~is expected to~~**shall** work and coordinate with the Engineer's on-site construction manager or resident project representative.

B. On-site Construction Management

The SI Project Installation Supervisor during construction and upon completion of construction ~~will~~**shall** inspect the work to confirm that it is done in a professional manner and in conformance to the contract and specification. The Engineer and COV Project Manager representatives will visit all installations (announced and unannounced) during construction and will inspect (announced and in accordance to the project schedule) installations upon completion of construction and develop a punch list for each site, and for each subsystem. The punch list will identify deficiencies, which the SI shall rectify prior to acceptance testing or acceptance. The Engineer will manage resolution of all SI punch lists.

In the event of termination and rescheduling of any announced inspection date or for failure to meet specifications, or for re-inspection of a site, system or subsystem that has been placed in acceptance default status, any additional costs due to the rescheduling which may accrue to the Commonwealth, such as costs for travel, living, and compensation is expected to be paid by the SI.

C. On-site Inventory Control

The SI Implementation Project Manager with assistance from the SI Project Installation Supervisor shall follow an implementation inventory control process set up by the COV Project Manager and the Engineer. The Engineer will define all items to be inventoried, the procedure for entering and tracking the items in the inventory process, and database and oversight to the inventory control process to confirm SI adherence to the process.

In the event of failure to fully support and follow the implementation inventory control process, any additional costs due to extra work incurred by COV to inventory the equipment is expected to be paid by the SI.

4.17 Migration including Cutover and Talk Group Development

A. Migration/Cutover Planning

COV desires that the Offeror submit a detailed migration and cutover plan with their proposal.

These plans should be tailored to the Offerors specific technology. The migration and cutover plans involves the transition of nineteen (19) state agencies and Federal users from their current operating situation to the upgraded system. COV desires that the migration and cutover appear substantially seamless to the users. As a baseline for the Offerors migration and cutover plans, the Engineer has developed an initial strategic phased migration plan (refer to Table 4-4 Baseline Phased Migration Plan) for the 19 identified user state agencies and Federal users. The SI's migration and cutover plans shall address the following elements for the entire life of the project:

- Agency service area boundaries
- VHF frequency give-backs
- Size of migrating contingent
- Agency migration category (public safety/non public safety)
- Interference aspects of frequency give-backs
- Capacity of the phase to absorb users
- Inclusion of new users after project phase is completed
- Inclusion of transfer of radios between vehicles after migration
- Recovery of radios from destroyed vehicles
- Location of installation and maintenance facilities
- **Dispatch Centers**

The Offerors migration and cutover plan shall also be in compliance with the phased schedules (refer to **Section 4.19 and** Table 4-2A through Table 4-2D) as the guideline for migration and cutover and that agencies migrate as their service area is covered to the desired coverage level of 95%. In addition, COV desires that there be minimal "outside the phase" construction. The Migration plan should accommodate COV agencies if they need to change their operational boundaries due to coverage area/communication zone concerns. The COV favors migration plans that meet or exceed the baseline migration plan schedule while considering these elements.

In addition, after the SI's migration and cutover plans are approved, the SI shall update and revise the migration and cutover plans as necessary as conditions change and, in no case, less than semi-annually.

~~COV desires the~~ **The** SI **shall** work with the COV Project Manager and the Engineer in a series of meetings and review cycles to minimize the impact of migration and cutover on each agency while bringing that agency on line on the system in an expedient manner consistent with the agency's operational situation.

Table 4-4 shows the baseline strategic phased migration plan for the nineteen (19) COV user agencies and Federal users.

B. Talk Group Development

The Offeror should prepare and submit a detailed talk-group plan with their proposal. It is desired by COV that this plan be flexible and designed to accept expansion, additions and updates and include interoperability talk groups and talk groups to meet emergency scenarios that could exist in the Commonwealth. COV desires that the result of this process provide an operational environment that is straightforward, easily understood by the users, addresses the routine and emergency needs of each of the 19 participating state agencies and Federal users from the perspective of the agency operating alone and also from the perspective of the agency operating along with other agencies in a multi-agency activity, and take into account (but not limited to) such factors as: interoperability, ease and straightforwardness of operation for all users, special emergency response scenarios and contingency programming (dynamic regrouping). COV further desires that this Talk-group Plan document and assign appropriate levels of priorities for voice and data groups.

In addition, COV also desires that the Offerors Talk-group Plan include the Offerors plan for radio user identifiers based on the present and future voice and data operational parameters. The Engineer has developed a preliminary radio user identifier plan, which is shown in Table 4-7.

As a basis for the Offerors Talk-group Plan, the Engineer has developed a preliminary talk-group plan, which is shown in Appendix G. COV desires, after the SI's Talk-group Plan is approved, that the SI shall update and revise the Talk-group Plan as necessary as conditions change and, in no case, less than semi-annually. ~~COV desires that t~~**T**he SI **shall** work with the COV Project Manager and their Engineer in a series of meetings and review cycles to keep the talk group plan current with changing requirements.

4.18 Testing

SI shall perform a number of equipment and system tests in accordance to Commonwealth approved acceptance test plans and procedures. The approved acceptance test plans will include the methodology and descriptions of the planned procedures, data resolution processes and format on how the test results will be displayed. The Engineer will review all acceptance test plans and procedures and assist the COV Project Manager with final approval of these acceptance test plan and procedures. Acceptance test planning and testing requirements are included in the subsequent LMR, Microwave, Mobile Data and Intranet specification sections. The COV Project Manager's Representatives and the Engineer will witness all tests and the Engineer will sign off the test sheets as they are completed.

The SI shall, for both Scenario 1 and Scenario 2, test all fixed equipment and subscriber units before receipt by COV. In addition to these factory tests, COV will test (for both Scenario 1 and Scenario 2) a representative sample of fixed infrastructure equipment and non-fixed radio subscriber units before receipt by COV. The ~~Engineer~~ **COV** at a warehouse facility (COV anticipates approximately seven different locations) provided by the SI will conduct the sample testing. The ~~Engineer~~ **COV** will review the quantity and types of subscriber units to establish an overall test plan, SI supplied test equipment **and software** required, and test schedule for testing the units. The ~~Engineer~~ **COV** will develop the test facilities for testing the subscriber units and provide the required test personnel to conduct the tests. The SI ~~is expected to~~**shall** provide at least one set of test equipment **and software,** and factory test and alignment procedures to COV.

The test results of each fixed equipment and radio subscriber unit will be documented and the units tested by ~~the Engineer~~**COV** will be annotated as such, before the unit is distributed to a site or to a radio user. All failed units will be returned to the manufacturer for repair or realignment. High levels of failure (> 2% of batch tested) for any equipment configuration will result in the return of the entire batch to the SI for rework. Once the unit is repaired, it will be re-tested and documented before it is distributed to a radio user. The SI shall pay any costs incurred by the Commonwealth to retest batch equipment that has been returned to the SI. The results of each test will be documented and signed off by ~~the Engineer and provided to~~ the COV Project Manager. The ~~Engineer~~ **COV** will coordinate the personnel, test facilities, and scheduling needed to execute the test plans and will perform the sample testing as described above.

As part of the SI's Mobile Data cutover planning, the SI ~~is expected to~~**shall** provide a detailed schedule for the installation of new and the removal and modification of existing COV mobile data equipment coordinated with the installation of the LMR voice radio equipment to minimize COV resource disruption. **This schedule shall be in conformance with the requirements of Section 4.19.** The Engineer will oversee the SI's removal, installation, and cutover of new and existing data units. Following installation, the Engineer will verify operation of a representative sample of the mobile data units. The Engineer will establish acceptance test criteria for the mobile data equipment (existing and new) and system, review test procedures proposed by the SI for incorporation of test criteria, and work with the SI to develop test procedure modifications that will adequately test equipment and system. Installation will be in accordance with the schedule for installation of existing and new mobile data units. The ~~Engineer~~ **COV** will inspect a representative sample of installations.

Following installation inspections, the SI shall verify operation of the existing and new mobile data units on the COV Mobile Data system. Testing will be in accordance with the narrative above for testing of existing and new units. The ~~Engineer~~ **COV** will test all new installations of existing mobile data units and a representative sample of installations of new mobile data units on a statistical basis.

4.18.1 System Acceptance Sequence

COV is planning to accept each radio subsystem in total. During migration of each phase, non-fixed equipment will most likely be installed early in the migration process and the COV may need temporary use of a mobile and portable radio in a convention (16F3E mode) channel operation. COV then plans to accept the system following acceptance of all radio subsystems with their interconnecting subsystems.

It may become necessary however, due to unplanned events, that COV desires to use a part of a subsystem, or the system, and if such becomes the case that use should be capable of not constitute acceptance unless such use continues for thirty (30) consecutive days (with the exception of a public safety mission requirement). The Offeror should state in their proposal how to handle and manage this requirement.

Such use notwithstanding, the sequence for acceptance for each project phase is expected to be as follows:

4.18.2 System Acceptance

COV will accept the system only after resolution of all punch list items, and after the SI demonstrates the operational viability of the system. Acceptance shall be demonstrated in the eight (8) areas:

A. Radio and MCT Facilities.
B. Coverage.
C. Interference.
D. Microwave Subsystem.
E. Blocking.
F. Intranet operation
G. Alarm System
H. Console (dispatcher and network) Operations

Within bounds, the specific means of demonstrating this viability will be left to the SI. The Offeror is expected to include a general description of the acceptance test procedures in the proposal. The SI ~~is expected to~~**shall** submit specific details of the acceptance test procedures to the COV Project Manager and the Engineer for approval at least ninety (90) days prior to beginning Facilities Acceptance Tests.

The SI shall provide all test equipment **and software** and personnel necessary to demonstrate the viability of the system. Test equipment **and software** should meet all manufacturers' test procedure requirements and be in current calibration.

Some tests may be made on equipment during staging, as described below. Tests made in the staging area notwithstanding, COV will not accept the tests or demonstrations until the completion of the final, as-installed facilities tests. Any equipment or systems deemed by COV to have been changed since previous testing or demonstration will at COV's option be re-tested under field conditions.

Final Phase acceptance shall be on a system basis only. Final System acceptance will occur after all Phase acceptances are completed. There will be no "conditional acceptance" by the COV of any portion of a system.

It is anticipated that all tests will occur at a mutually agreed upon time scheduled at least thirty (30) days prior to beginning the tests. It is further anticipated that once an agreed upon sequence of tests begins, testing will continue without interruption until completion of that test sequence.

Should specific device or subsystems fail to meet specifications during that period COV may, at the Commonwealth's option, elect one of the following procedures:

A. The SI would repair or realign the equipment and would then retest that device or subsystem later in that test sequence.

B. The SI would retest the device or subsystem at a later date and submit the results to the COV Project Manager for approval.

4.18.3 Acceptance Remobilization

In the event that devices, subsystems, or systems fail to meet specifications upon retest, or in the event that multiple devices or subsystems fail during any one-test sequence, COV may, at the Commonwealth's option, terminate the test sequence for rescheduling at a later date.

In the event that the SI has provided notice that work is complete and the system or subsystem is available for inspection or acceptance testing, ~~and should the system or subsystem then be inspected or tested at a mutually agreed upon time and place according to the mutually agreed upon inspection list or test plan,~~ and should COV, upon reviewing the inspection record or test results, determine that the system or subsystem fails the test or inspection and requires correction and re-inspection or re-testing, ~~than~~**then** the system or subsystem will be considered to be in "Acceptance Remobilization".

For any reason of "Acceptance Remobilization", the COV Project Manager and the Engineer must be notified.

In the event of termination and rescheduling of any test for failure to meet specifications, or of re-inspection or re-testing of a system that has been placed in "Acceptance Remobilization ", any additional costs due to the rescheduling which

The SI is expected to log each observed problem, and address each problem within ten (10) working days of receipt. "Addressing the Problem" shall be defined, for purposes of the User Evaluation Period alone, to be one of the following results:

(A) Resolution of the problem.
(B) Registration of the problem as a warranty problem, with a plan of action for resolution of the problem.
(C) Explanation of the problem to COV's satisfaction.

In every case, the SI is expected to formally respond to the user with a copy to Commonwealth's Project Manager, stating how the problem has been addressed. This should occur within ten working days of receipt of the problem.

The SI is expected to retain a working log of the progress of the problem in hard and soft form. At the end of the User Evaluation Period, the SI ~~is to~~**shall** provide the working log to the COV Project Manager and the Engineer in both electronic and hard copy format, along with copies of all User Evaluation Period documentation.

4.19 Schedule

Table 4-2A through Table 4-2D shows the schedules envisioned by COV for this project.

COV **highly** desires that the SI ~~**shall**~~ meet or exceed the turnkey project schedule. Therefore ~~COV desires that~~ the Offeror **shall** submit a detailed project schedule showing time in weeks (or days) from **contract award**~~notice to proceed date~~, which outlines all **operational milestones**~~tasks~~ associated with the implementation of the communications system. COV desires that the schedule identify all major delivery milestones, ~~projected~~ implementation start and completion milestones, **individual agency migration milestones,** Commonwealth ~~R~~**r**eview/**approval periods**, ~~projected~~ training schedules, inspection and acceptance testing schedules, operational, **zone** migration and cutover milestones.

COV desires that each milestone be clearly identified with description, date to be accomplished, and responsibility. The COV highly desires that the Offeror use the current version of CA - SuperProject scheduling software (developed by Computer Associates) in order to be compatible with schedules already in place. The SI is responsible for assisting the Engineer on a regular basis with project schedule updating and maintenance. The SI schedule update and revisions shall be provided to the COV Project Manager and the Engineer as part of the monthly reporting requirements.

The Phase I ninety (90) day Commonwealth **System** Review period closely examines the Phase I system and equipment **functionality and performance** ~~operation~~ by **testing and** exercising the system with a ~~limited number~~ **full complement** of users ~~simulating~~**under** actual operational conditions, and applying the results of this ~~pre-cutover~~ testing to both the first phase and the design of succeeding phases. The COV Project Manager and the Engineer will evaluate the Phase I ninety (90) day **Commonwealth** ~~s~~**S**ystem **Review** testing results and data after which COV may, at its option, commission either additional evaluation by the Engineer, or redesign of the system by the SI. During this ninety (90) day Commonwealth **System** Review period the Engineer will perform a number of tests on the system, participating agency personnel that are testing/exercising the system will provide operational feedback, and there will be regularly scheduled meetings and teleconferences with COV to discuss the results of testing, system status, problems and other issues. The build-out of the remaining phases of the project shall be contingent on the successful implementation and testing of Phase 1 and the approval of the COV Project Manager.

The SI will not be given permission by COV to proceed (Notice to Proceed) **with the project** until all LMR and Microwave sites are acquired, and all associated FCC and FAA permits, registrations and licenses are issued. **If additional frequencies are required beyond the currently identified and licensed COV frequencies, the SI shall perform a paper study for researching these additional frequencies before Notice to Proceed is issued by the COV Project Manager.** The necessary FCC Type Acceptances shall be obtained by the **manufacturer prior to the** SI ~~prior to delivery of~~**ordering** equipment. In addition, no radio equipment will be **received** ~~ordered~~ by COV without Commonwealth possession of the associated Radio Station Authorizations issued by the FCC. **The SI is not authorized to begin work on Phases 2, 3 and 4 until a Notice to Proceed has been issued by the COV Project Manager.** The SI shall schedule the project's tasks in accordance with these requirements.

4.20 Reporting

COV desires that the SI provide periodic reports to the COV Project Manager and the Engineer on the status of the implementation (Refer to Section 4.13.2 - Project Correspondence). COV desires that status reports be issued regularly by the SI's Project Manager. COV desires that as a minimum, these reports be issued on a monthly basis, with the first report due one (1) month after Notice to Proceed. COV desires that upon the initiation of the first on-site activity or the shipment of the first material, which ever occurs first, reports be issued two (2) times each month, on the working day nearest the 15th of the month and on the working day nearest to the last day of the month. COV desires that delivery of issued reports be made in a manner that realistically insures delivery to the COV Project Manager and the Engineer within two (2) working days. COV anticipates that under extenuating circumstances, reports may be issued more frequently.

This reporting specification is not intended to require a lengthy or detailed report with great attention to esthetics; rather it is intended to be a timely description of the status of the project. COV desires that as a minimum each report contain the following:

A. Statement of progress toward the project schedule. COV desires that if the schedule has changed for any reason, a revised schedule be submitted for COV'S approval. COV expects that the SI also submit a proposed solution so as not to effect slippage of the final acceptance date.

B. Statement of the progress made during the immediate past reporting period.

C. Statement of the projected plans for the next reporting period.

D. Statement of problem area (red flag) items hindering the progress of the project and a proposed solution to the problem so as not to effect slippage of the final acceptance date.

E. Statement of problem areas that have been resolved and the actions taken to affect the resolutions.

In addition, the submittals listed in Table 4-3, Reporting Schedule, are due throughout the term of the contract. These have been described in this specification in detail, and are provided here only in summary.

COV desires that submittals be provided individually or as grouped in Table 4-3 with an appropriate cover letter for each submittal stating the name and description of each submittal attached, and the specification section number reference against which the submittal is made. Partial or incomplete submittals will not be accepted. E-mail submi**ttals**~~ts will be allowed but~~ **in advance of the** hard copy **are highly desired. However, hard copy** will govern for record purposes.

The SI shall provide all submittals in the appropriate quantity to the COV Project Manager with one concurrent copy to the Engineer.

TABLE 4-2A
PROJECT SCHEDULE
PHASE I - CZ-01 & CZ-02

Schedule Event	Calendar Days after RFP Issue	Calendar Days After Contract Execution
RFP ISSUANCE (01-AUG-01)	0	
PREPROPOSAL CONFERENCE	16	
PROPOSALS DUE (28-NOV-01)	119	
PROFORMANCE TESTING COMPLETE	225	
EVALUATION COMPLETE	250	
RECOMMENDATIONS DUE	270	
CONTRACT EXECUTION DATE	300	
START OF PHASE I IMPLEMENTATION		1
DETAILED (ALL PHASES) DESIGN REVIEW		60
PROJECT NOTICE TO PROCEED/START OF PHASE I IMPLEMENTATION		150
PHASE I MICROWAVE INFRSTRUCTURE INSTALLATION COMPLETE		290
PHASE I LMR INFRSTRUCTURE INSTALLATION COMPLETE		304
START OF PHASE I ACCEPTANCE TESTING		305
PHASE I MOBILE DATA INFRSTRUCTURE INSTALLATION COMPLETE		315
PHASE I INTRANET INFRSTRUCTURE INSTALLATION COMPLETE		325
PHASE I ACCEPTANCE TESTING COMPLETE		369
PHASE I 30 DAY PERFORMANCE PERIOD COMPLETE (01-JUL-03)		399
PHASE I 90 DAY RICHMOND AREA COV SYSTEMS REVIEW TESTING COMPLETE (01-OCT-03)		491
PHASE II NOTICE TO PROCEED		506
PHASE I CUTOVER\FINAL DOCUMENT COMPLETE		536
AGENCY MIGRATION COMPLETE FOR PHASE I		566
FINAL PHASE I SYSTEM ACCEPTANCE		583
START OF PHASE I WARRANTY		584
90 DAY USER EVALUATION PERIOD COMPLETE		673

TABLE 4-5
PROPOSAL OPTIONS

PROPOSAL REFERENCE	OPTIONAL REQUIREMENT
Section 4	
4.9.6	One-year hardware SI maintenance contracts for each LMR, Microwave, Mobile Data and Intranet.
4.9.6	Maintenance contract for the system fixed equipment and non-fixed equipment, that maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis
4.9.7	Software maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis.
4.9.7	Software support package that provides periodic non-corrective upgrades that enhance the proposed software package
4.9.9	At the end of each project phase warranty or maintenance period the full complement of applicable spares be delivered to the COV in a repaired condition
4.12.3	All training be conducted in Richmond.
4.18.4	Intranet based solution to facilitate processing the User Evaluation Forms.
Section 6	
6.3.1.12	Provide a means for inserting new encryption keys over-the-air, in order to eliminate the requirement for users to come to a central point whenever a new key is issued.
6.3.9.1	APCO Project 25 interface for the Federal Law Enforcement Wireless User's Group (FLEWUG).
6.3.12	Implementation and use of an AVL system.
6.3.15	Spare parts, training, test fixtures, and special test equipment needed outfit 29 maintenance service vehicles, 4 tower maintenance vehicles, 3 equipment installation crews, 8 regional service centers and a Richmond depot center. For the depot center, 3 fixed equipment, 7 portable equipment, 10 mobile equipment and 3 board level fixed equipment test equipment packages are required by the COV.
6.3.16	Equipment: Per-unit cost for forty (28) installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a trunk-mount mobile radio
6.3.16	Installation: Per-unit cost for forty (28) installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a trunk-mount mobile radio
6.4.4	Both models should include an option for operation in a digitally encrypted mode. This voice encryption option will be internal to the radio.
6.4.5	A version of the control head should be available to control up to three additional conventional radios.
6.4.7	Portable Radio Unit: optional battery pack (clam shell) that allows the use of readily available batteries (e.g. AA) with a minimum of six hour operational life
6.4.7	Portable Radio Unit: optional speaker-microphone kit, and a concealment kit for covert operation.
6.4.7.1	Portable Radio Unit (all tiers): operation in a digitally encrypted (AES) mode. This voice encryption option will be internal to the radio.
6.4.12.1	Other mounting configurations for Control Stations (Rack and Wall).
6.4.14.2	Increase the channel name capability to 1000.
6.4.14.2	Several furniture options be available and priced, including Watson, Skagg, and any other furniture commonly used by the Offeror.
6.4.14.9 (D)	High Tier console (or Mid Tier console if connected directly into the system) to selectively communicate in an intercom basis with any other console.
6.4.14.10 (C)	Paging Codes: All standard formats (1+1, 2+2, DTMF, Rotary dial, EIA single tone, burst tone).
6.4.16.1	Discrete transmitter site security camera system, as an option, which can be operated in concert with the LMR alarm system
6.4.21.2	Receiver: Battery /Charger

TABLE 4-5
PROPOSAL OPTIONS

PROPOSAL REFERENCE	OPTIONAL REQUIREMENT
6.4.21.2	Receivers: Weatherproof mounting enclosure.
6.4.23.4 (A)	"No-ground plane" antennas for non-metallic surfaces.
Section 7	
7.1	Video Conference capabilities
7.1 (C)	Yearly maintenance service for board and component level maintenance of all microwave equipment.
7.21	Voice Over IP Dispatch Service
Section 8	
8.16.1	Bar Code Reader
8.16.2	Biometric Device
8.16.3	Automatic Vehicle Location
8.16.4	Vehicle Mounted Printer
Section 9	
9.7.1	System Security: Smart Cards, Biometric Devices, or Challenge/Response Tokens.
Section 10	
10.10.4 (C)	Discrete transmitter site security camera system, as an option, which can be operated in concert with the LMR alarm system
10.11.4 (F)	Cost addition or reduction that provides capacity for tenant loading that the Offeror believes to be adequate for each particular location.
10.14.10	Thirty (30) days prior to performance test, generator supplier should provide for a preventive maintenance service contract that starts on the day of final acceptance
Section 11	
11.11.8 (I) 10	SI provided maintenance (including routine preventive).
Section 12	
12.12.2 (I)	Preventive maintenance service contract to COV for a period of one (1) year starting on the day of final acceptance.

OFFEROR: _____

TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
	Section 4	
4.0	The **Offeror** shall provide a detailed proposal for Scenario (1) including elemental prices (as described in section 13) for each ownership, maintenance, and operational situation.	
4.0	The Offeror shall also provide a detailed proposal for Scenario (2) including elemental "per seat" prices (as described in section 13) for each ownership, maintenance, and operational situation.	
4.1	The Offeror shall submit their proposal in hardcopy and in an Adobe Acrobat PDF format **as described in Section 1-3 of this document.**	
4.1.1	The Offeror is also expected to complete the "yellow shaded" blocks of the column in Table 4-6 titled "Offeror Proposal Location" with the proposal section number where the corresponding submittal is located.	
4.1.1	The Offeror shall conduct a performance test of the mobile radio system technologies as part of COV's proposal evaluation process. Offerors shall provide a working prototype of the system module that is representative of the system as they propose.	
4.5	Should the Offeror take exception to anything contained in the referenced Standards, documents or Specification Appendices, the Offeror shall provide a complete and detailed description of the exception. **Blanket exceptions shall not be allowed.**	
4.7	It is also desirable that turn-around time for return-and-repair boards be described in the Offeror's Proposal.	
4.9	The Offeror shall state in the Proposal the name, address, and capabilities of the service station(s) providing warranty service. The Offeror shall identify in their proposal for each service station(s) their experience with wide area (City, County or Statewide) digital radio system installation, operation and maintenance **similar to and exact items being proposed.**	
4.9	The Offeror shall describe in their proposal the methodology of this control. *[Under Scenario 2 hardware configuration, spares, software, firmware, passwords, network access, documentation and encryption keys shall be under strictest control of the SI.]*	
4.9.1 C	**The Offeror should separately price in their proposals (as a minimum), test equipment, standard and custom test figures, repair machines, depot spares, training (all electronic equipment and software), manuals, documentation (to the component level), etc. required by the COV to set up a COV field and depot level maintenance and repair facilities.**	
4.9.4	The Offeror shall describe in their proposal under what conditions will the COV be allowed to provide warranty period preventive maintenance services, potential costs incurred, and potential cost savings for the COV.	
4.9.4	The Offeror shall describe in their proposal the preventive maintenance routines and programs for major infrastructure equipment especially battery systems, systems prone to lightning (such as antenna subsystems components, computer processor equipment, etc.) and equipment exposed to outside environmental elements.	
4.9.4	The Offeror shall also describe in their proposal preventive maintenance processes and procedures for towers, portable radio and MCT batteries.	
4.9.5 (H)	Offerors shall include their maintenance shop locations in their Proposal. At least eight (8) **equipped and staffed maintenance shops** should be evenly divided throughout the COV.	
4.9.5 (I)	Offerors shall describe their proposed escalation procedures to be used in the event COV determines problems are not being resolved within an adequate timeframe.	
4.9.6	It is the intent of the COV, in Scenario 1, to perform maintenance and repair services. The Offeror should explain in their proposal what is required and what is included in their proposal offering for this important COV project repair and maintenance requirement.	
4.9.6	**The Offeror shall propose, as an option (Scenario 1), a maintenance contract for the system fixed equipment and non-fixed equipment to be renewable on a yearly basis.**	
4.9.7	**The Offeror shall propose, as an option (Scenario 1), a software maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis.**	
4.9.9	The Offerors should provide in their proposal a complete listing of proposed spare parts, including spare part name, applicable fixed or non-fixed equipment name the spare is part of, total number of applicable equipment units serviced by this spare part, spare part quantity, price and anticipated spare part storage location(s).	
4.9.9	The Offerors shall provide costing in their proposal for a complete set of boards for all proposed fixed equipment. Additionally, COV desires that Offerors suggest which of the listed boards are deemed necessary to ensure the reliable operation and rapid restoration of the system.	
4.10	The Offerors shall address this issue (SI Support) in the Proposal, describing also the mechanisms for reporting the availability of upgrades and for procuring and implementing those upgrades.	

OFFEROR: _____

TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
4.10	COV desires that the Offerors certify in their Proposal that board and component level parts for all equipment proposed be available during installation and continue to be available for the period of production of that equipment, or for a period of twelve years following notice to proceed of the Phase in which that equipment is delivered, whichever is greater.	
4.10	The Offerors shall state in their Proposal the locations and level of parts availability for all permanent parts depots serving the Commonwealth of Virginia area.	
4.11.4	Should the Offeror take exception to anything contained in the referenced Standards, documents or Specification Appendices, the Offeror shall provide a complete and detailed description of the exception. **Blanket exceptions shall not be allowed.**	
4.11.9	The Offeror should include in their Proposal, a detailed description of how they will support this requirement *[COV expects that Commonwealth operating and scheduling requirements will be maintained at all times. This will require the SI to perform specific elements of the work (including, but not limited to, such items as cutovers, installation of non-fixed equipment, etc.) during periods outside of the COV'S normal working hours. COV expects that such work be performed by SI at no additional cost to the COV.]*	
4.12.3	The Offeror shall describe in detail their training programs and training support services to be offered.	
4.17 (A)	COV desires that the Offeror submit a detailed migration and cutover plan with their proposal. **The Offerors migration and cutover plan shall also be in compliance with the phased schedules (refer to Section 4.19 and Table 4-2A through Table 4-2D) as the guideline for migration and cutover and that agencies migrate as their service area is covered to the desired coverage level of 95%.**	
4.17(B)	The Offeror should prepare and submit a detailed talk-group plan with their proposal.	
4.17 (B)	**COV also desires that the Offerors Talk-group Plan include the Offerors plan for radio user identifiers based on the present and future voice and data operational parameters.**	
4.18.1	The Offeror should state in their proposal how to handle and manage this requirement. *[It may become necessary however, due to unplanned events, that COV desires to use a part of a subsystem, or the system, and if such becomes the case that use should be capable of not constitute acceptance unless such use continues for thirty (30) consecutive days (with the exception of a public safety mission requirement)]*	
4.18.2	The Offeror is expected to include a general description of the acceptance test procedures in the proposal.	
4.19	~~COV desires that t~~The Offeror **shall** submit a detailed project schedule showing time in weeks (or days) from **contract award** ~~notice to proceed date~~, which outlines all **operational milestones** ~~tasks~~ associated with the implementation of the communications system.	
	Section 5	
5.2.1.5	The Offeror shall describe in their proposal survivability plans, for events including but not limited to: natural disasters, manmade disasters, terrorism **other criminal activity,** & acts of god.	
5.2.2.1	The Offeror is to provide documentation in their proposal to demonstrate how the system is designed so that coverage can be expanded in the following ways: *[Refer to section for list.]*	
5.2.2.1	COV desires that the Offeror provide documentation in their proposal establishing how the COV is protected from reductions or loss of coverage due to interference (including jamming or hacking), either from external or internal sources.	
5.2.2.2	The Offeror shall also demonstrate in their proposal how they plan to maintain within the system: Tower Capacity (COV Space); Building Capacity (COV Space); Power Supply (both primary and back-up).	
5.2.2.2	COV desires that the Offeror demonstrate how the COV is to be protected from impeded system access due to interference (including jamming or hacking) either from external or internal sources.	
5.2.2.2	The Offeror shall describe how they are prepared to: Add non-COV related equipment to the network; Lease space to other companies; Escort non-SI personnel.	
5.2.2.3	COV desires that the offeror demonstrate that the flexibility of the fleet map be such that the system will readily accept changes in the structure to meet the needs of special events, task force creation, and disaster responses for temporary needs of the COV.	
5.2.2.5	The COV should have access to both raw and compiled data. The Offeror's plan of action is to explain how they are to accomplish this.	
5.3.1.5	The Offeror shall describe in their proposal survivability plans, for events including but not limited to: natural disasters, manmade disasters, terrorism **other criminal activity,** & acts of god. The Offeror is requested to provide a synopsis of their plan as part of their proposal.	
5.4.1	Offerors for this system shall provide all pricing information to allow the COV to purchase the system and operate and maintain it as a COV owned system.	
5.4.1	The Offeror shall present all pricing information in the format and detail as described in Section 13.	
5.4.2	COV also desires to be offered sufficient information and detail to explore a public/private partnership.	

OFFEROR: _____

TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
5.4.2	COV desires that the Offeror provide to the COV flat rate, monthly service charges for the following services: *[Refer to section for list.]*	
5.4.3	The Offeror is to describe in detail in their proposal, their financial approach using these funds.	
5.4.3.1	Offerors shall include in their proposal their offer of division of gross revenue in a percentage format, with the sum of both percentages equaling 100%.*[It is desired that the gross revenue be divided between the COV and the SI. All COV portions of the revenue should be deposited in the Site Revenue Fund.]*	
5.4.3.1	Offeror shall include in their proposal their offer of division of net revenue in a percentage format, with the sum of both percentages equaling 100%.*[During the Initial Term of the Access Agreement, it is desired that the net revenue from Third Party Users of sites and towers be divided between the COV and the SI.]*	
5.4.3.1	The Offeror shall include in their proposal the market analysis or methodology used to calculate the requested revenue provisions.	
5.4.3.2	The Offeror shall include in their cost proposal their request for initial contribution.	
5.4.3.4	COV desires that the Offeror establish in their proposal a discount factor below their proposed unit cost for equipment.	
	Section 6	
6.1.1	The Offeror shall supply sufficient **radio and control** equipment, install that equipment **and connect their radio equipment to a shared test antenna system** at the SPHQ tower **site** in Richmond, as well as to supply sufficient staff, to demonstrate that equipment functionality as described herein.	
6.1.2	The Offeror shall provide the equipment for a fully operational multiple channel VHF radio site that includes control equipment, and radio equipment using the technology being proposed, and tuned **to set of** COV **narrowband VHF** frequencies, **which are licensed for use at the Richmond SPHQ transmitter site.**	
6.1.2	**The Offeror shall also provide a complete BER test equipment setup, including both fixed-base and non-fixed mobile BER test equipment. The COV Project Manager and the Engineer will use this BER test equipment setup to conduct BER measurements on the Offeror's technology specific evaluation system.**	
6.1.4	The Offeror is expected to respond to each paragraph contained in this specification document.	
6.1.4	The Offeror is expected to provide a response matrix whereby these specifications are listed and presented as a comparison to what the Offeror can produce.	
6.1.5	The Offeror shall propose a dual mode LMR system capable of supporting both digital and analog subscriber units in response to these specifications.	
6.1.5	The Offeror is be expected to provide pricing, when requested, for both analog and digital non-fixed units as listed in the price pages.	
6.1.5	The Offeror is expected to provide pricing for all necessary hardware, software, test equipment, installation, and integration of the proposed LMR system into the existing LMR system.	
6.1.5	The Offeror is expected to describe the capability of their LMR system (both fixed infrastructure and non-fixed) to operate in the following manner, such that non-fixed equipment can be purchased in two configurations: analog and dual-mode.	
6.1.5	The Offeror is expected to describe in detail the means to accommodate all projected additional users during the first five years.	
6.1.5	The Offeror is expected to offer a total turnkey LMR, MW, and MCT system to the COV.	
6.2	**The Offeror shall provide their coverage guarantees that describe the level to which they will meet the COV's coverage objectives in each communications zone.**	
6.2	The Offeror shall submit coverage plans that are expected to be developed according to the data derived from industry accepted propagation forecast tools and methods, analytical interpretation of the propagation data and data taken from field tests.	
6.2	If 14 additional LMR sites are necessary and not sufficient, the Offeror shall substantiate why the selected sites were chosen and why other areas were left without coverage (if any).	
6.2.1.2	While the COV's design goal is a minimum 95% coverage availability throughout the Commonwealth, the Offeror shall guarantee a defined coverage availability throughout the Commonwealth.	
6.2.1.5	The Richmond metropolitan area (see Figure 6-1 and Table 6-3) will also have a requirement for in-building coverage, which requirement is expected to be addressed in the Offeror proposal, and which requirement is expected to be guaranteed and tested separately.	
6.2.1.4 (B)	It is desired for the Offeror to provide the COV with the efficiency loss factor for their portable in hand, at head level, and on the hip, in the proposal.	
6.2.1.4 (B)	Should the Offeror use a vocoder with a different modulation scheme, the COV requests that they define the required BER and provide measured data to substantiate that the BER level defined by the Offeror is indeed equivalent to a DAQ of 3.4 under the conditions described in TSB-88A.	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
6.2.1.4 (E)	COV desires the Offeror to provide in their proposal, an analysis of this situation, including the attenuator requirement necessary to fulfill this specification. The Offeror should be prepared to demonstrate this as part of the pre-award evaluation testing. *[COV desires both analog (11K0F3E) and digital tests to be made for acceptance purposes. Since a 10 microvolt signal is considerably higher than that required to produce a 2.0% BER in a typical receiver, BER tests are expected to be made with a signal reducing attenuator in the non-fade test radio antenna line. This attenuator would be sufficient to reduce a 10 microvolt signal to the level equivalent to the required field strength that produces a 2.0% BER on a test bench increased by 3.0 dB.]*	
6.2.1.4	If 14 additional LMR sites are necessary and not sufficient, the Offeror shall substantiate why the selected sites were chosen and why other areas were left without coverage (if any).	
6.2.1.5	The Offeror is expected to include a detailed description of the propagation models used, and the assumptions made in preparation of the charts will be included in the proposal. The Offeror shall provide coverage charts in their proposal, as supporting documentation.	
6.2.1.5	The Offeror is expected to specifically confirm, by analyses, coverage in any critical communications locations identified by the COV.	
6.2.1.10	The Offeror is expected to include the estimated duration of the Coverage Acceptance Test in the proposal.	
6.2.1.12	The Offeror is expected to analyze the data collection method that is chosen and present justification for its selection.	
6.2.2	**The Offeror shall design their system to exceed whatever coverage level they define, so that they statistically meet their guarantee.**	
6.3	The Proposal should contain a detailed technical analysis including drawings and written description that shows the hierarchy proposed, including the effect on the LMR voice system, the Microwave network system, and any other systems that might be affected.	
6.3	The Offeror should provide GOS (Grade of Service) analysis data to substantiate their designs as part of the proposal.	
6.3	The Offeror is expected to explain in detail in the proposal, the approach used to provide LMR service for aircraft, boats, armored vehicles, and motorcycles.	
6.3	The description in the proposal is expected to address how the Offeror intends to address such issues as co-channel intra-system interference between Communications Zones that might affect re-used radio frequencies. Aircraft radios (and their installation) shall be compliant with all Federal regulations.	
6.3	It is suggested that the Offeror submit several conceptual solutions that depict system balance; one solution utilizing the existing sites, and other solutions utilizing additional sites.	
6.3	For any proposed site where other equipment is co-located, the Offeror shall include sketches, descriptions, and supporting calculations in their proposal to confirm that intermodulation, transmitter noise, and desensitization from and to other co-located equipment will be minimized to the point as described herein.	
6.3.1.12	The Offeror shall provide a detailed description of the digital encryption algorithm proposed and an analysis of the ability of the algorithm to withstand attempts to break it.	
6.3.1.12	The Offeror is requested to provide a detailed description of this Over the Air Rekeying Option, including the means to secure the process, and the operational conditions under which it will work.	
6.3.1.13	The Offeror should describe their systems' capability to expand channels, user groups, etc., and to modify system and unit configuration without the requirement to physically remove each non-fixed unit from operational service for reprogramming.	
6.3.2	The Offeror is expected to provide in the proposal a detailed technical analysis of this Cell Site including drawings and descriptions.	
6.3.2	**The Offeror is to include a Disaster Recovery Transportable Site (DRTS) that is to be used by VSP technicians (Scenario 1) in the event that a LMR site is lost.**	
6.3.3	The Offeror is to provide a design plan that accommodates this requirement. This plan should include the description of the special equipment necessary to accomplish reliable in-building communications in the *City of Richmond Capitol buildings areas is the only region in the Commonwealth where the system is to be designed for in-building portable radio penetration. The overall intent is to provide building coverage, including coverage in parts of buildings below ground level.]*	
6.3.3	Since GPS will not work in buildings for coverage testing, the Offeror must provide a method for collecting and inputting data into the coverage testing equipment	
6.3.4	The Offeror is expected to provide a detailed plan in the proposal that ensures coverage in these locations. This plan should include the description of the special equipment necessary to accomplish reliable subterranean communications. *Such equipment may include split coaxial antenna systems, Bi-Directional Amplifiers (BDAs), and satellite receivers. [There are eight (8) highway tunnels in the Commonwealth that must be covered with this system.]*	
6.3.4	Since GPS will not work in tunnels for coverage testing, the Offeror must provide a method for collecting and inputting data into the coverage testing equipment.	
6.3.5	The Offeror is expected to describe, in detail, the approach to providing a Mobile Data System including the use of the MDTs	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
6.2.5	Since MCT transmissions are exempt from the same transmission criteria as voice trunking, the Offeror is asked to devise a MCT coverage test that measures a successful multiple packet block transmission containing 5000 bits minimum, with a less than 2% BER, from a stationary vehicle operating from the same tiles that are used in the voice coverage tests.	
6.3.7	The Offeror shall submit a Site Location Configuration Matrix. This Matrix must include the geographical location of the site, proposed additions and modifications to the site, site equipment projections, tower and antenna data. Proposed new sites are to be included in this Matrix.	
6.3.8	The Offeror is expected to describe in detail in their proposal their approach to this upgrade *[Should the Offeror propose upgrading the Orbacom consoles, those upgraded consoles may therefore, need to be relocated as necessary to ensure that all the consoles at any Dispatch Center are either the upgraded Orbacom consoles or new consoles (i.e., no vendor mixing, either all Orbacom upgrades, or all new). In addition, the VCP consoles are expected to have sufficient space to include the PRC CAD terminals and keyboards in the console configuration.]*	
6.3.9.1	Vehicular interfaces for commercial wireless data services are to be considered in the Offeror's interface plan.	
6.3.10	The Offeror will be expected to provide the COV with a detailed list, perhaps in the form of an overlay that depicts the existing communications system as compared to the proposed communication system.	
6.3.12	The Offeror is expected to describe, in detail, the proposed system's capability to provide these features, including as a minimum the following *[Refer to section for list.]*	
6.3.13	The Offeror shall describe in detail any call scenarios that exceed the one (1) second access time as defined herein.	
6.3.15	The Offeror shall provide a detailed plan for the provisioning of spares.	
6.3.15	Offeror shall provide a list of spares, not considered as "standard catalog items", which are deemed critical to the operation of the LMR system such as, but not limited to, special antennas, cavity filters, wiring harness, and interface cables.	
6.3.15	The Offeror is expected to provide a Spares Provisioning Matrix, which shows the assemblies that are to be considered as critical and require spares, the associated MTBF for these assemblies, and the form of supply (stocked spare or available loaner).	
6.3.15	The Offeror shall provide a plan for spare provisions in detail. This plan shall include the financial options for spare provisioning, realistic MTBF data that is verifiable, and any business options that may be jointly acceptable to the COV and the Offeror	
6.3.15	The Offeror is expected to provide, as a separately priced option, a schedule of spare parts, training, test fixtures, and special test equipment needed outfit 29 maintenance service vehicles, 4 tower maintenance vehicles, 3 equipment installation crews, 5 regional service centers and a Richmond depot center. For the depot center, 3 fixed equipment, 7 portable equipment, 10 mobile equipment and 3 board level fixed equipment test equipment packages are required by the COV	
6.3.16	The Offeror is requested to provide a detailed description of their approach to aircraft operations with respect to their proposed technology and protocols.	
6.3.16	The Offeror shall, as a priced option (equipment and installation priced separately, Scenario 1), provide the per-unit cost for forty (40) installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a trunk-mount mobile radio.	
6.3.16	Offeror shall describe in their proposal the process to be used to obtain limited FAA certification for the number of installations required.	
6.3.16	The Offeror is expected to provide as part of their proposal a full description, including drawings and other details of the interface to the aircraft avionics audio distribution panel.	
6.3.16	Offeror is expected to provide as part of their proposal an analysis of the anticipated impact of operating an aircraft installed radio at high altitude within a simulcast system. If special ground installed equipment is required, it needs to be described fully, with appropriate cost estimates in the Avionics option.	
6.4.1.2	In general, equipment should be designed to operate within specifications described in Table 4-1. Any deviations from this environmental requirement are to be specifically identified by the Offeror.	
6.4.3.1	The Offeror should describe in detail their approach to controller equipment including block diagrams, explanatory text, and a table of technical characteristics	
6.4.4	The Offeror shall describe the methods used to protect the LMR system from unauthorized and stolen portable radios.	
6.4.4.1	The Offeror is requested to provide a description of their approach to mounting their radios and control heads into such aircraft, and their operational recommendations for such aircraft with respect to their proposed technology and protocols.	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
6.4.4.1	The Offeror is requested to provide a detailed description of their approach to mounting radios and control heads in a motorcycle environment, so that they will meet the environmental specifications and the MIL STD testing in Table 4-1. Please also describe precautions taken to comply with 47 CFR with respect to radiation in a motorcycle environment.	
6.4.5	Offeror should describe controls that will be provided for the various features in detail.*[Control Head]*	
6.4.6	The Offeror shall describe how encryption code will be protected from unauthorized use in the event that a portable radio is stolen.*[Dash Mount Mobile Radios]*	
6.4.6.2	The Offeror should describe controls that will be provided for the various features in detail	
6.4.7	The Offeror is requested to describe in detail, including pictures and specifications, portable radios that fall in this category, for any of the three (3) operational configurations bands listed	
6.4.7	Offeror is to present lists of which units are available as intrinsically safe, based upon the requirement in Table 4-1.	
6.4.7.1	The Offeror is requested to describe in detail each of these tiers including pictures, specifications, and recommended operating applications.	
6.4.7.1	Offeror should describe, in detail, the feature set that will be provided for the various models	
6.4.8	The Offeror shall describe in their proposal a battery maintenance plan for portable radio batteries	
6.4.12.1	The Offeror is requested to provide separate pricing options for other mounting configurations.	
6.4.14.1	The Offeror is requested to describe in the proposal the extent of tailoring available, and the protection scheme to prevent unauthorized access to sensitive system control features.	
6.4.14.2	The Offeror is requested to provide detailed furniture and enclosure descriptions including pictures, specifications, dimensioned drawings, and color/materials samples.	
6.4.14.2	The Offeror is requested to provide a detailed technical description in their proposal describing how they intend to address this issue.*[VSP Cad System]*	
6.4.14.4	The Offeror is requested to provide a detailed description of the Basic Tier package, including pictures, dimensioned drawings, and technical characteristics and functionality.*[Operator Consoles]*	
6.4.14.7	Offerors is requested to describe in the proposal in technical detail the remote capabilities of their console, modem rate and number of circuits required in the interface	
6.4.14.9 (B)	The Offeror is expected to specify in the proposal the maximum number of patches that can be simultaneously selected and the maximum number of resources in each patch	
6.4.14.9 (D)	Please provide a detailed technical description, including block diagrams and descriptive text, showing console related equipment, fixed-end switching equipment, and describing any additional voice or data circuits necessary to allow this to happen. *[Console - Intercom]*	
6.4.14.9 (E)	The Offeror is requested to provide a detailed technical description of this feature, including the extent to which it can be used as standard (can it be used system-wide, or only within consoles interconnected to a CEB; can it be used between Mid-Tier consoles, etc.) *[Console - Supervisor Position]*	
6.4.14.9 (G)	Please describe the extent to which the System Manager can provide system-loading effects of this operational function.*[Consoles - Phone Patch]*	
6.4.14.9 (I)	The Offeror is requested to provide a technical description of the interface **including physical properties** (RS-232, USB, etc) **and command message requirements**.	
6.4.14.11	The Offeror is requested to provide a detailed technical description of the way in which they propose to provide this system redundancy, including applicable block diagrams, text description, and a description of operational impact.	
6.4.16 (D)	The Offeror is requested to provide a detailed description in their proposal of the subsystem that is intended to provide this function, including diagrams and description.	
6.4.16.1	If this is proposed, the Offeror shall also clearly define the loading such a security system will have on the network.*[Discrete Transmitter Site Security Camera]*	
6.4.16.8	The Offeror is to describe in detail the hierarchical approach to defining alarms as major or minor and classify the alarm types according to their criticality.	
6.4.16.8	The Offeror is to include a plan that describes a typical alarm system and its operation that specifically includes SCADA scenarios.	
6.4.17.3	Potential for such situation should be identified by the Offeror as such.*[Failure to report backbone alarms, or any alarms that might indicate a catastrophic failure should the backup equipment subsequently fail, should be considered a catastrophic failure.]*	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
6.4.18 (8)	The Offeror is expected to describe in detail in their proposal, their approach to system or component failure, specifically addressing all failure situations identified above	
6.4.19	The Offeror is expected to describe the system's management capabilities in their proposal.	
6.4.19	The Offeror may depart from the specific monitored functions described above, providing that the Offeror describes how alternate monitored functions will provide the same information.	
6.4.19.1	The collector is requested to describe in their proposal scenarios that have occurred in Virginia and the solutions implemented *[Taken on Scenario Based Talk Groups]*	
6.4.20	The Offeror is expected to describe the data collection and management software capability in detail, in their proposal.	
6.4.23	The Offeror is expected to provide a detailed analysis of all antenna systems used in this LMS system. This analysis should provide gain/loss data, description of fittings, coax, and height/lightning recommendations. In line lightning arrestors and grounding apparatus must be fully described.	
6.4.23.1	The Offeror should identify the characteristics of unused ports that might be available to combine transmitters required by future system expansion.	
6.4.23.4	If the Offeror plans to use a gain antenna, they are requested to provide measured data that confirms the antenna can maintain this gain in the horizontal direction.	
6.4.23.4	The Offeror shall describe how they intend to mount VHF (high and low band), CB, cellular, and UHF antennas next to each other.	
6.4.23.4	The Offeror shall also describe how they will accommodate vehicle equipped with LOJACK	
6.4.23.5	The Offeror is urged to provide an antenna efficiency number for portable in hand, at head level and at the waist level.	
6.4.24	The Offeror is expected to provide a detailed plan as to how the security of this device will be safeguarded.	
6.5.1.1	The Offeror is expected to describe in detail, as part of the proposal, their approach to amplitude and envelope delay equalization, supported by block and level diagrams	
6.5.1.1	Offeror is expected to describe their approach to frequency stability. This description is to include specification of both the primary and secondary frequency standards, including stability characteristics, adjustment ranges, and MTBF data.	
6.5.1.1	The Offeror shall describe the procedures and facilities for routine verification of system alignment, re-alignment, and re-equalization.	
6.5.1.2	The Offeror is expected to address on whether the floor space described in Section 12 will be adequate for the Dispatch Center electronics and system manager equipment.	
6.5.1.2	The Offeror is requested to describe in their proposal the quantity and size of the console control equipment to be installed in support of the consoles, and the approximate size of the physical area needed.	
6.5.1.2	The Offeror should provide samples of color and texture of all cabinetry and writing surfaces.	
6.5.1.2	The Offeror is requested to provide a plan for disposal of surplus equipment, either as trade-in or cine sale, along with a statement of its worth.	
6.5.1.3	The Offeror is requested to describe anticipated failure modes, and to provide the operational impact of those failure modes in their proposal.	
6.5.1.3 (D)	The Offeror is urged to develop a test plan for packet message transmission using the MCTs.	
6.5.1.7	The Offeror is requested to specify in their proposal the degree to which the system is to be tested at a staging area, and should include the location of that staging area as well as a staging test plan and a staging test schedule.	
6.5.1.7	The Offeror is requested to include the estimated duration of the Facilities Acceptance Test in the proposal.	
6.5.2	The Offeror should include in their Acceptance Test Plan a demonstration of the interoperability and compatibility with the foreign systems specified in Appendix D	
6.7.2.1	The Offeror shall provide, in the Pricing Forms (Section 13), a breakdown of costs associated with each site proposed, whether the site is Commonwealth property, purchased or leased, as part of the Initial Cost.	
6.7.2.2	The Offeror is expected to describe the proposed repeater and satellite receiver site facilities in detail in the proposal, including description and specifications where applicable for the following, as a minimum: *[Refer to Section for List]*	
6.7.3	The Offeror is expected to provide costs based on average installation of a gain Yagi antenna on a wooden 50-foot pole, with 150 feet of transmission line, and transmitter power to provide the required coverage in the proposal.	
	Section 7	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
7.1	It is expected that the Offeror recommend the optimum system routing for those additional links required by the trunked system based on the functional system design diagrams listed in Table 7-1; Figure 7-1; and Appendix I	
7.1	The microwave equipment documentation will include, as a minimum, the components*[Refer to Section for List]*	
7.1 (C)	As an option, it is requested that the Offeror provide a yearly maintenance service for board and component level maintenance of all microwave equipment	
7.2	The Offeror is expected to offer, and be responsible for, total turnkey design and implementation, , which includes as a minimum*[Refer to Section for List]* All these elements are expected to be clearly defined and explained in the Offeror's Proposal system description.	
7.2	It is expected that the proposal clearly describe the system configuration and any microwave path protection scheme offered.	
7.2	The Offeror may include an additional alternative plan to loop the microwave backbone as a whole and not based on upon VSP Division Headquarters.	
7.6	Detailed documentation of the required microwave test equipment is expected to be clearly defined in the Offeror's Proposal.	
7.9	The Offeror is expected to submit a detailed project schedule in their Proposal showing time in weeks (or days) from contract execution date, which outlines all tasks associated with the implementation of the microwave communications system.	
7.11	The Offeror is expected to provide sufficient details for the microwave/multiplex subsystem, including the upgrade to the existing microwave/multiplex and the installation of additional links, to enable breaking this item out from the rest of the contract	
7.14	**The Offeror shall provide a general plan to microwave cutover with the proposal, and a detailed microwave cutover plan to the COV Project Manager and the Engineer. These plans shall be in conformance with the schedule requirement of Section 4.19.**	
7.14	The Offerors shall include estimated anticipated costs associated with cutover, and necessary to be born by the COV, in the proposal	
7.14	The Offeror shall provide a brief description of their approach to this migration in their Proposal. This description shall specifically address the following concerning*[Refer to Section for List]*	
7.14.2.	Where the Offeror has identified digital microwave paths that require a capacity overbuild, the Offeror is expected to describe the method used to replace the digital microwave path. COV requests that the Offeror describe fully in their Proposal the methodology used to overbuild the identified paths.	
7.15	In the event that dedicated telephone lines are required as part of this system, (to example, in the implementation of the satellite receiver portion, it is expected that the Offeror include both recurring and nonrecurring costs of those lines in the proposal as part of the base price. Recurring costs should be based on the present cost of the service per year times five (5) years.	
7.17.1.B	The Offeror is expected to provide in their Proposal the guaranteed specifications for system gain, transmitter power output, and receiver threshold proposed to meet the path performance objectives listed in Section 7.12	
7.17.6	It is requested by the COV, that the Offeror include and propose a system-wide redundant Stratum 3E master clock standard to provide the necessary synchronization of the microwave system to support the STARS network	
7.20.2	The COV requests that the Offeror identify available capacity on the STARS microwave radio system that the COV may utilize to provide circuit service for other public and private entities.	
7.20.2	It is desired that the Offeror identify the capacity and connectivity that can be utilized by the COV to establish a communications service	
7.20.2	It is desirable that the Offeror provide as monthly DS1 revenue estimate that the COV could realize from this type of program. The Offeror should include the DS1 revenue estimate in Section 13 of the Specification.	
7.20.3	It is desired by the COV that the Offeror establish a trade-in program to refurbish and/or resell all microwave radios and ancillary equipment including, but not limited to antennas, coaxial cable, converve, pacific data, multiplexers, batteries, power supplies, cable, and hardware that are removed from service. It is the COV's expectation that the Offeror establish and describe in their Proposal this program to minimize the cost of upgrading the existing network	
7.20.3	It is expected that the Offeror provide in their Proposal microwave link revenue estimate that the COV could realize from this type of program. The Offeror shall include the estimate in the Pricing Forms provided in Section 13.	
7.21	The Offeror should include a cost estimate, as an option, to provide remote dispatching application for one dispatch office in the Price Forms provided in Section 13	
7.22	It is desired that the Offeror address the future growth potential telecommunications requirements of collocated wireless providers, as well as the COV'S growth plans when planning a microwave tower communications site.	
7.22	The COV urges that a development plan be established that will facilitate partnerships with other local government entities and/or the private sector businesses to integrate the telecommunications requirements of all potential wireless providers onto an overall Comprehensive Plan.	
7.22	It is urged that the Offeror include a yearly revenue estimate that can be realized by the COV for the collocation of a wireless provider's antenna platform at typical STARS tower site. The monthly revenue estimate should be delineated in the Price Forms provided in Section 13.	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
	Section 8	
8.6.1	The Offeror shall provide a complete description of switch operation, and the expected effects of adjustments in the parameters used to select commercial wireless data services. The switch should operate without user input	
8.6.1	The Offeror shall define the number of retries allowed under commercial wireless data services before the system shifts to STARS.	
8.7.5	**The Offeror shall also submit a second MCT unit that substantially meets these environmental characteristics for non-law enforcement (public safety) use, but which offers a significant cost savings.**	
8.7.5	COV desires to deploy cost effective units where possible. The Offeror shall identify where these cost effective units deviate from these requirements.	
8.7.6	**The Offeror is expected to identify any special or modified components in their proposal.**	
8.7.12	**The Offeror shall propose a second messaging client where Microsoft Outlook is used for other message needs.**	
8.7.12	The Offeror shall identify the software intended for this purpose and describe the data collection and processing path.	
8.7.12	The offeror shall describe how the proposed software operates to sent and receive data. Included in this description is detailed discussion of how the limited bandwidth is used to best advantage to maximize the number of users and minimize transmission time.	
8.7.12	Offeror should clearly and functionally describe any middleware that is interposed between the application program and the communication programs.	
8.8.2	The Offeror shall certify in their proposal that a correctly installed MCT will not impair the functioning of any vehicle safety system, including, but not limited to passive restraint or air bag system in accordance with the vehicle's manufacturer's guidelines	
8.9	Offeror shall explain in their proposal how error detection and correction will be accomplished.	
8.10	The Offeror should describe the queuing process, any limitations (i.e. maximum number of messages, maximum time, etc.) and what action(s) are taken when messages are not delivered	
8.13.1	The Offeror shall identify in the proposal the system data rate(s) available under the proposed systems and specify any conditions where this data rate cannot be met.	
8.13.5	It is desired that the Offeror provide detailed instructions in their proposal details for the following: *[Refer to Section for List - Message Recording]*	
8.15.1	The Offeror shall provide estimates of the system reliability.	
8.15.1	Where the Offeror proposes a system in which the voice and data share the same channels or equipment, the Offeror shall clearly describe how these two needs are allocated as well as how the data traffic will be kept from interfering with priority radio traffic	
8.15.2	The Offeror shall provide in the proposal the calculations necessary to support their estimated system loading.	
8.15.5	The Offeror shall provide calculations in their proposal showing that the mobile computer terminal system can meet the message transmission reliability and system throughput time specified above. The traffic analysis shall be based on the number of units described in appendix E.	
~~8.17.3~~	~~The Offeror shall provide a cost plan which will demonstrate all functions of the mobile computer terminal operating at rated channel rate and transmitting data as described above~~	
8.17.3	The Offeror shall provide a separate mobile computer terminal system test plan explaining how the mobile computer terminal system will be tested for message transmission reliability and system throughput.	
8.18	The Offeror shall include in the proposal the following information: **Detailed design description,** system block diagram; description of operation; list of hardware and software; guaranteed specification for each major component; approach to collecting facial profiling data; message queuing requirements and system interactions for message delivery delay; **grade of service (GOS). Expected mobile data coverage operability limit in terms of bit error rate (BER).**	
8.18	**The Offeror shall provide a list of and price for the additional equipment required on the Pricing Forms provided in Section 13.**	
8.19.3	**The Offeror should describe their implementation of this process in their proposal.**	
	Section 9	
9.3	The Offeror shall describe in their proposal how these implementation and migration specifics are to be implemented and how the future phases(s) are anticipated to be implemented	
9.4.1	The Offeror shall identify in their proposal alternate connection methods, their benefits and their costs. *[Class I Service]*	
9.4.2	The Offeror shall identify in their proposal alternate connection methods, their benefits and their costs. [Class II Service]	

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TABLE 4-6
PROPOSAL REQUIREMENTS & SUBMITTALS

Proposal Reference	Submittal Requirement	Offeror Proposal Location
9.6.1	The Offeror is expected to identify any special or modified components in their proposal	
9.6.2	Offeror shall provide in their proposal calculations of the ability of their proposed design to meet this specification.	
9.6.5	The Offeror shall describe in their proposal a formal **continuous** process, to remain aware of any security concerns with any proposed or installed upgraded equipment.	
9.6.7	The Offeror shall provide a milestone chart that identifies equipment hardware or software changes that are required to meet the system expansion described above.	
9.6.8	The Offeror shall define how QoS is established and monitored across the wide area data network. It is desired that the Offeror describe the algorithm used for the bandwidth management process and indicate any anticipated increase in network latency through this approach.	
9.6.8	**It is desired that the Offeror describe the algorithm used for the bandwidth management process and indicate any anticipated increase in network latency through this approach.**	
9.6.11	The Offeror shall fully describe the proposed back-up process in their proposal.	
9.7.5	The Offeror shall describe in their proposal the measures to assure that the Intranet cannot be compromised through this access.	
9.7.9	The Offeror shall describe, in detail, the intrusion detection system, and evaluate the possibility of false positive or false negative detections. The Offeror shall provide a detailed description of the effect that the intrusion detection system has on overall system performance. The Offeror shall also describe in their proposal how this intrusion detection system will safeguard the connected Mobile Data, LMR, and Microwave network from external or internal threats.	
9.9.1	The Offeror shall propose performance metrics in their proposal for the following unloaded system parameters: Latency, Packets per second, Round trip delay (300ms) for mission critical traffic.	
9.9.2	The Offeror shall also propose performance metrics in their proposal for the following operational parameters considering simultaneous access by one-half of the maximum MCT's expected to be in use during the busy hour: Latency, Packets per second, Round trip delay (300ms) for mission critical traffic **(exclusive of the response of any external database).**	
9.11	Offeror shall describe in their proposal a detailed System Administrator, which shall be a CCV person located in the Network Control Center, training plan.	
9.13.2	The offeror is expected to provide a detailed description of the surge suppression means in their proposal.	
9.15	The Offeror shall provide a basic Cutover Plan as part of their proposal.	
9.4.5, 9.16	The Offeror shall include in their proposal the following information: System block diagram, with connection options available commercially and dedicated CCV circuits; Description of operation; Demonstration of how the proposed system meets % utilization and collision rate numbers; The implementation and migration plan; List of equipment, including the server(s) anticipated; Guaranteed specifications for each major component; List all equipment hardware and software proposed. Alternates may also be provided where cost or system efficiency can be enhanced; List the anticipated Intranet performance metrics; A complete description of the security design, including means to assure transmission security, prevention of external and internal unauthorized access and unauthorized use by otherwise authorized individuals; Documentation of the qualification(s) of the network development, maintenance and installation personnel; Description of the training and technical support to be provided and the period over which this support will be provided (separate descriptions for Scenario 1 and Scenario 2); Description of the measures anticipated for electrical protection including surge suppression and uninterruptible power supplies; Description of the means to	
	Section 10	
10.11.4.(F)	The Offeror is to submit, as an option in the proposal, a cost addition or reduction that provides capacity for tenant loading that the Offeror believes to be adequate for each particular location. The offeror shall also explain the plans for tenant loading.	
10.11.4.(G)	The Offeror shall explain in their proposal the procedure for moving existing tenants in the proposal.	
	Section 11	
11.11.8 (D) 11	**For Scenario 1, the Offeror shall propose training, spare parts and maintenance as described in Section 4 of this document.**	
	Section 12	
None	None Required	

TABLE 4-7
RADIO USER IDENTIFIER PLAN

Agency	# of Initial Voice Radios (Approximate)	# of Initial Data Terminals	# of Radio Id's	Identifiers Blocked for Agency	Comments
ABC	108	0	500	1001-1500	
Aviation	4	0	500	1501-2000	
Capitol Police	112	15	500	2001-2500	
DCR	416	80	1000	2501-3500	
DOC	1590	0	3000	3501-6500	11,605 Total VHF & UHF Radios
VDEM	169	30	500	6501-7000	
DEQ	15	20	500	7001-7500	
DFP	8	0	500	7501-8000	
DOF	976	14	2000	8001-10000	
DGIF	580	199	2000	10001-12000	
DOH	8	0	500	12001-12500	
DIT	46	8	500	12501-13000	
DJJ	123	9	500	13001-13500	580 Total VHF & UHF Radios
MRC	188	95	500	13501-14000	
DMA	66	4	500	14001-14500	
DMME	155	0	500	14501-15000	
DMV	133	0	500	15001-15500	
VSP	3535	1503	10000	15501-25500	
VDOT	4647	0	10000	25501-35500	
FEDERAL USERS	237	25	1000	35501-36500	
OTHER –3rd Party Users	TBD	TBD	13500	36501-50000	
TOTAL	13116	2002	49000		

This section constructs this relationship in areas of record keeping, system infrastructure, operations, maintenance, enforcement, and finance. Partnership provisions, in these areas, must be interpreted in light of the 'essential agreement'.

5.2 Inspections, Record Keeping, Documentation

It is required that the COV has access to all information concerning the operation and financing of the system. This involves all reports generated by the system monitoring computers, as well as manually completed maintenance, installation, repair, and routine reports completed concerning the radio system. This access is intended be provided to the COV throughout the life of this agreement. As part of this requirement, any discussions with jurisdictions or agencies not on the network concerning the system shall be with the COV Program Manager (or designee) in attendance.

5.2.1 Physical

5.2.1.1 Electronic Infrastructure

COV desires that the SI provide as part of the Land Mobile Radio (LMR) Network, equipment that allows for the ability of the COV to monitor LMR and Mobile Computer Terminal (MCT) radio traffic activity at each ~~cell~~**site**.

The SI shall ensure that the performance of the system will meet or exceed the applicable performance levels described in the Contract. This documentation is to be reviewed annually to ensure compliance with all applicable regulation.

Subsystem Uptime will be calculated on a weekly basis and applied over each calendar monthly and quarterly period~~s~~. COV desires that these calculations be provided to the COV on a monthly basis initially. COV desires that the reports demonstrate that each repeater has an uptime **equal to or** greater than ~~or equal to~~ 99.8% when calculated as stated above. Further, system uptime is defined as all time not in catastrophic failure mode as described in Section 4. COV desires that the system uptime be 99.9%.

COV desires that LMR and MCT (if separate networks) interference levels at any site be demonstrated annually to not have deteriorated above the design criteria.

COV desires that the SI provide as part of the LMR Network, equipment that allows for the ability of the COV to monitor LMR, MCT, and Microwave Network **Infrastructure**~~Backbone~~ (MWN**I**~~B~~) system parameters.

5.4.3.1 Revenue Provisions

The SI may market any of the wireless communications towers that are accessed under this agreement to other tenants. Existing sites and new and/or revenue generating sites are listed in Appendix B. The SI may also explore the use of other COV land to fund this network. The SI, with COV's consent will have the right to market the radio portion of the Communications System to eligible Third-Party Subscribers, so long as each subscriber's use in no way compromises system or site security or diminishes the COV's current or future use of the system or its rights to control its FCC licenses. The SI may have the right to market the towers accessed, subject to the rights of any owners of underlying real property and to all provisions of law.

The SI is expected to utilize prudent business practices and market the system consistent with the usual and customary practices and rates. On a quarterly basis, COV desires that the SI supply the COV with a summary of all current leases by Third-Party Subscribers. The summary is to be in electronic format and include the Lessee's name, lease expiration date, lease amount, etc. As requested by the COV, the SI is expected to provide copies of individual leases. COV desires to be a signatory and the COV Project Manager will be involved in the negotiation for all issues that involves COV sites or the STARS network.

It is desired that the gross revenue be divided between the COV and the SI. All COV portions of the revenue should be deposited in the Site Revenue Fund. Offerors shall include in their proposal their offer of division of gross revenue in a percentage format, with the sum of both percentages equaling 100%.

Revenue received from Third Party Users of the sites**,** ~~and towers~~ **towers, and Microwave** will be shared as follows:

During the Initial Term of the Access Agreement, it is desired that the net revenue from Third Party Users of sites and towers be divided between the COV and the SI. Offeror shall include in their proposal their offer of division of net revenue in a percentage format, with the sum of both percentages equaling 100%.

After the Initial Term of the Access Agreement, it is desired that the net revenue from Third Party Users of sites and towers be divided between the COV and the SI. Offeror shall include in their proposal their offer of division of net revenue in a percentage format, with the sum of both percentages equaling 100%. It is anticipated that the percentage during this term of the contract will be weighted more heavily in favor of the COV.

For purposes of this section, net revenue is defined as all revenues received less ground rent, if any. The revenue sharing arrangement and percentages as set forth above may continue, as agreed between the COV and the SI, after the end of the Initial Term regardless of the end of term option the COV chooses. Net ~~Income~~**Revenue** is to be deposited in the Site Revenue Fund

Taxes imposed by any taxing authority relating to the services or the system shall be the responsibility of the SI. Taxes that are considered as part of the per seat costs shall be described as such in the pricing provided to the COV.

The Offeror shall include in their proposal the market analysis or methodology used to calculate the requested revenue provisions.

5.4.3.2 Initial Costs

COV expects the SI to prepare all regulatory licenses, consents, approvals and waivers reasonably necessary for the ownership and operation of the Communications System used by COV. The SI is to pay all charges, fees and taxes in regard to obtaining such licenses, consents, approvals and waivers with the exception of FCC coordination fees. In addition, the COV and the SI will cooperate in obtaining the use of needed sites including, but not limited to, all zoning and land use permits relating to the Communications System. The COV will retain control and authority over its FCC licenses and their use, which will at no time be transferred to the SI.

The COV may assign all ground leases or other instruments of conveyance to transfer rights necessary to operate and market the towers. In this regard, the COV may:

- Make modifications to the ground leases as needed
- Execute any reasonable instruments of conveyance necessary to such conveyances including assignment agreements, certificates of estoppels, etc.
- Have underlying property owners maintain a zero rental or nominal lease rate
- Execute an Interagency Agreement by and among relevant agencies.

In cases of default of lease agreements, COV desires that all lease holdings revert to the COV.

COV desires that it will be given consideration for lease assignment of wireless communications sites in the form of a purchase credit for goods and services, at mutually agreed upon amounts. Individual site valuation shall be included in the Section 13 pricing forms. This site valuation shall be for both existing sites and new and/or revenue generating sites as listing in Appendix B. The Offeror shall include in their cost proposal their request for initial contribution.

5.4.3.3 Per Seat Costs

The SI is expected to provide the availability and service of multiple cost level LMR and MCT subscriber units ranging from those providing basic service to full featured public safety equipment. Per Seat costs are expected to include:

- Communications Service (Air Time)
- Equipment
- Maintenance
- Repair
- Operator Training
- All Other Requirements Described Herein

Each COV approved user agency or group will be expected to be permitted to purchase or lease subscriber equipment, console sub-systems, and any other individual user based equipment at contract prices created by this agreement.

At the COV's request the SI may act as the COV's agent for the sale of any existing **infrastructure**~~backbone~~ and subscriber equipment that the COV may wish to sell. The sale proceeds will be shared between the SI and the COV. COV desires that the SI provide the COV an accounting of the sale and the COV's share of proceeds within thirty days of the SI's receipt of proceeds.

5.4.3.4 Future Purchase Costs

The SI is expected to provide support for LMR and MCT non-fixed equipment for as long as the equipment is in operation, and the infrastructure supporting that device has been accepted by the COV in that area.

Contract prices for equipment established by this agreement should apply to leases for the term of ten (10) years**.**

6.1.1 Pre-Award Equipment Evaluation

The COV will conduct a pre-award evaluation of LMR- equipment as proposed by the Offerors. In order to objectively evaluate proposed equipment, it will be necessary to establish a Baseline Test Site. The Baseline Test Site will house the Baseline Test System and will be located at the Virginia State Police Headquarters (SPHQ) tower in Richmond. From this site, **field strength, bit error rate (BER), audio quality,** ~~propagation~~ **propagation,** and functional testing will be conducted to help establish suitability of the equipment proposed for the COV's upgraded system. COV will supply -**and install** the baseline infrastructure equipment **and antenna systems** needed to conduct the evaluation tests. The Offeror shall supply sufficient **radio and control** equipment, and install that equipment **and connect their radio equipment to a shared test antenna system** at the SPHQ tower **site** in Richmond, as well as to supply sufficient staff, to demonstrate that equipment functionality as described herein.

The Baseline Test System infrastructure equipment will consist of a conventional analog narrowband VHF repeater with a duplexer, connected to an omni directional antenna system. This baseline antenna system will be installed on the Richmond SPHQ tower. Also included will be several ~~**conventional**~~ **narrowband digital VHF vehicular repeater systems**~~**mobile radios**~~ **used for baseline functional and audio quality testing.**

A shared test antenna system will also be installed by the COV on the Richmond SPHQ tower. It is anticipated that separate omni directional transmit and receive antenna systems will be utilized for evaluation testing of the Offeror's proposed equipment and technology.

6.1.2 The Test Process

Comparison testing of the proposed equipment will entail measuring both the field strength**, bit error rates (BER)** and understandability ("Delivered Audio Quality" - DAQ) for the proposed equipment, as well as to demonstrate the functionality required herein. ~~Voice and data tests will be conducted. Data~~ **Field strength and DAQ** will be compared to that obtained from equivalent tests performed on the Baseline Test System. The Baseline Test System will be operational through the test process and will be maintained by the **STARS Management Team**~~VSP~~. The COV Project Manager and the Engineer will conduct the tests with the assistance of the Offeror.

Each Offeror measurement program will necessarily be done sequentially. The comparison test will be done in real time, and share common equipment such as antennas, in order to have a common baseline. It is the intent of the COV to complete this testing

as part of the evaluation of the Offerors proposal, such that the proposed equipment and system is demonstrated to be a viable offering and indeed is capable of producing communications as maintained in the proposal. It is the intent of the COV to conduct these tests after proposals have been evaluated in detail, meet all of the mandatory requirements, and before negotiations with short-listed Offerors are completed.

The COV Project Manager and the Engineer will conduct both absolute and comparison tests on both the Baseline **Test** System and the technology specific system, which include field strength, DAQ, **BER,** and functionality measurements, and then provide a comparison analysis to the Baseline **Test** System. The performance test conducted at the Baseline Test Site **shall be**~~will become~~ an integral part of the evaluation process used in determining which Offeror will be granted the award.

The Offeror shall provide the equipment for a fully operational multiple channel VHF radio site that includes control equipment, and radio equipment using the technology being proposed, and tuned to **a set of** ~~the~~ COV **narrowband VHF** ~~test~~ frequencies**, which are licensed for use at the Richmond SPHQ transmitter site**. The COV will provide a single base station antenna port. A minimum of **six portable (hand-held) radios (on the mobile radio channels/frequencies),** three (3) sets of mobile radio equipment are expected to be provided, and three (3) sets of vehicular repeater radio equipment complete with portable radios (which may operate on a different radio band). ~~Mobile units and vehicular repeaters may be the same unit.~~ **The Offeror shall also provide a complete BER test equipment setup, including both fixed-base and non-fixed mobile BER test equipment. The COV Project Manager and the Engineer will use this BER test equipment setup to conduct BER measurements on the Offeror's technology specific evaluation system.** The Offeror can house their equipment in their own trailer or make use of an existing VSP trailer. To reduce installation and set up time, **it is highly desired that** the Offeror ~~is encouraged to~~ use a trailer with their own equipment already installed. The Offeror is **strongly** encouraged to "stage" and debug all equipment before testing. ~~The Offeror shall be responsible for providing frequencies for use in testing.~~

In addition to providing three (3) sets of vehicular repeater radio equipment, it is highly desirable that the Offeror install each vehicular repeater (including proposed mobile antenna and mounting location) into a 2001 or 2002 Chevrolet Impala automobile.

The basis of evaluation will include, among others, the following demonstrations as compared to the proposal provided by the Offeror:

- VHF Radio performance in the presence of VHF noise and under multipath conditions.
- Demonstration of the viability of the proposed "automatic frequency selection" protocol (an example of which might be trunking) including any necessary

control channel and control equipment.

- Demonstration of vehicular repeaters including multiple repeaters arriving at the same location at the same time, under the "automatic frequency selection" protocol proposed. Demonstration of vehicle repeaters, including multiple repeaters arriving at the same location at the same time, under the "automatic frequency selection" protocol is suggested. Demonstration of interoperability with existing VSP units (Motorola PacRT and GE Exec II with high band detectors). Backward compatibility is **mandatory**~~required~~.

Engineering/installation and LMR system testing/maintenance services, removal/modification, reconditioning and/or relocation of existing equipment, leased facility and circuit costs, and all non-recurring and recurring five (5) year costs specified will be included in the proposal. The Offeror is expected to offer a total turnkey LMR, MW, and MCT system to the COV.

The SI shall provide the COV Project Manager a letter certifying that the installation of any equipment is compliant with the manufacture's guidelines, including air bag compliance, prior to any equipment being installed in each specific type (make, model, and year) of vehicle.

6.2 Coverage

The Offeror should provide the most reliable, cost effective LMR system that meets the coverage ~~demands~~**objectives** specified in this document. The Offeror can use LMR system techniques that have been developed to enhance and extend area coverage such as voting receivers, transmitter steering, simulcasting, digital computer controlled wide area systems. **The coverage objectives describe the Commonwealth's highly desired performance of the network. Coverage objectives are the same as coverage requirements. The coverage objective should be the design goal of the SI. The coverage objective is not a mandatory requirement because it is not certain that all offerors can provide this level of performance when limited to 14 additional LMR sites. Therefore, the Offeror shall provide their coverage guarantees that describe the level to which they will meet the COV's coverage objectives in each communications zone.** The COV's coverage ~~expectation~~ **objective** is 95% **and the Offeror's proposals will be evaluated by this goal**. This applies both to the LMR Voice system and the Mobile Data System. 95% coverage is defined as having an area equally divided into 100 pieces and being able to communicate successfully, within a specified grade of service, with 95 of them. The COV's coverage ~~requirement~~ **objective** of 95% has been established to insure optimum system reception in consideration of the geographical terrain of Virginia.

The Offerors shall submit coverage plans that are expected to be developed according to the data derived from industry accepted propagation forecast tools and methods, analytical interpretation of the propagation data and data taken from field tests. Coverage plans will be evaluated, according to coverage area probabilities, where coverage area probabilities less than 95% will have a negative impact, and coverage area probabilities greater than 95% will have a positive impact. Also taken into consideration in the evaluation will be the degree to which the Offeror uses existing LMR sites, and the amount of coverage to be guaranteed if additional LMR sites (not to exceed 14) are included. If 14 additional LMR sites are necessary and not sufficient, the Offeror shall substantiate why the selected sites were chosen and why other areas were left without coverage (if any).

It is also an area where different Offerors may have substantial differences of opinion in how coverage is to be measured. The test philosophy presented in TSB-88A is to be used as a common reference for the COV Project. Since TSB-88A does not describe a test plan, but rather provides guidelines for testing, it is the purpose of this sub-section to act as a coverage test plan framework, for which the Offerors can model their procedures.

While the COV's design ~~goal~~ **objective** is a minimum 95% coverage availability throughout the Commonwealth, the Offeror shall guarantee a defined coverage availability throughout the Commonwealth. As part of the procurement process, the Offeror's guarantees of coverage will ultimately be specified in the contract between the COV and the SI.

The Coverage Test Plan is also included as part of the functional specifications and will describe the conditions under which coverage will be demonstrated.

The Offeror ~~is expected to~~**shall** design their system to exceed whatever coverage level they define ~~for, s~~**to that they statistically meet** their guarantee. Their design will take this coverage reliability into account when sites are established. This may mean, under certain circumstances, that they might require additional sites beyond those, which the COV Project Manager and the Engineer deem as necessary to provide the requisite coverage. It is the desire of the COV that the SI use the sites established by and currently in use by the COV, and to describe the level of coverage that would be guaranteed under that condition. If deemed necessary, the SI may add up to fourteen (14) additional LMR sites. A tiered approach to planning a coverage solution is shown as follows:

1. Provide coverage predictions using all VSP LMR existing sites and indicate the coverage areas not meeting the 95% coverage objectives.

2. Provide coverage predictions using all existing sites and up to 14 additional sites and indicate the guarantees per Communications Zone, where that guarantee does not meet the 95% coverage objectives.

3. Use approach 2, above, and state the coverage

The Coverage Test Plan will address two components: verification tests by the SI, and confirmation tests on the basis of a valid statistical sample by the Engineer.

It is also understood that the COV may test some of the coverage independently. The system will be deemed satisfactory and accepted only if both the verification tests and the confirmation tests are passed. In the event there is a discrepancy between the verification tests and the confirmation tests, the discrepancy will be resolved before proceeding further.

6.2.1.3 Service Area Definition

The current Virginia State Police Communication LMR and MW System are the basis for this upgrade project. They are divided into 7 Divisions. Each Division (with the exception of Division 7) is divided into two Communications Zones, and each part is allocated a radio frequency channel (which are reused throughout the state).

For the purpose of this test plan, each Communications Zone will be considered a Service Area, thus each Service Area has its own frequency channel.

The Service Areas are further broken down into tiles; each tile is typically ½ to one mile square. Coverage data will be recorded in each tile and the data will be compared to computer generated propagation predictions. Coverage data is correlated and analyzed and the results are provided in a final report.

Table 6-1 summarizes the Communications Zones.

Each Communications Zone consists of all the area contained within the boundaries as shown on the Communications Zone boundary map contained in Appendix A. In TSB-88A, service areas are termed Usage Loss Service Areas (ULSA), which are defined as Communications Zones for the purpose of this specification.

The Richmond metropolitan area (see Figure 6-1 and Table 6-3) will also have a **mandatory** requirement for in-building coverage **and coverage in and around the tunnels**, which requirement ~~is expected to~~**shall** be addressed in the Offeror proposal, and which requirement is expected to be guaranteed and tested separately.

The Outdoor ULSA mobile coverage encompasses the remainder of the Commonwealth, including tunnels (as listed in section 6.~~4.3~~**3.4**), and is restricted to mobile radio operation.

6.2.1.4 Voice LMR Radio and Data Coverage Performance Objectives

NOTE: Coverage objectives are intended to apply to both high capacity LMR systems and conventional LMR systems and mobile data (e.g., special conventional networks as described in Section 6.3, Network Interface, in the System Specification) required to operate throughout the service area. Objectives for Mobile Data are separate, and are contained in the part of this section describing mobile data testing.

The SI is expected to provide the digital audio quality and bit error rates (BER) as described in Table A-1 of TSB-88A for the COV's communication system. BER is influenced by the particular modulation scheme that is utilized by the Offeror's design. Because specific BER values are a factor of circuit architecture, specific architectures are not generally known until the Offerors have disclosed their designs. The industry assigned a 2% BER as acceptable for system testing, that being the equivalent of a DAQ-3.4 rating for an IMBE vocoder. In other words, 2% of the highest speed bit stream utilized in the system would establish the maximum acceptable BER. BER testing is to be included in the SI's Coverage Test sequence in order to verify digital performance. The communications system is to be designed to provide the designated signals for Talk-out and Talk-back under the following conditions:

A. Mobile radio talk-out and talk-back is established to be 31dBu* (median) at the roof of the vehicle in a guaranteed minimum of 95% ~~of the randomly selected outdoor locations within each~~ of the COV's Communications Zones.

* dBu is a measure of field intensity and is compared to other commonly used parameters as follows:

dBu	Field Intensity $\mu V/m^2$	Power Density W/m^2	Receiver Threshold μV	Receiver Threshold dBm
0	1	2.65E-15	.25	-119
1	1.12	3.34E-15	.28	-118
9	2.83	2.12E-14	.7	-110
31	35.48	3.34E-12	8.78	-88.12

B. Portable radio talk-out for outdoor **locations is 31 dBu (median)** and **for** in-building locations is **23**1 dBu (median), at the four-foot level in 95% of the randomly selected ~~outdoor~~ locations within each of the Communications Zones or within the Richmond indoor service area. Radio talk-back is to provide 31dBu (median) field strength from 95% of the randomly-selected outdoor**, and provide 21 dBu (median) field strength from 95% of the randomly selected** ~~or~~ indoor locations at the associated receiver, considering the portable to be hand held at the 6 foot level, and including the portable efficiency loss in this configuration. It is desired for the Offeror to provide the COV with the efficiency loss factor for their portable in hand, at head level, and on the hip, in the proposal.

Heavy Building ULSA portable coverage in Richmond is assumed to incur a 25 dB building loss. This requirement is expected to address the heavy government buildings that must be covered in support of agencies with personnel inside those buildings.

Talk-out coverage is based on the portable radio held in the hand with the antenna mounted waist high. Talkback coverage is based on a mobile antenna mounted at the 6-foot level.

Note: 31dBu is expected to provide acceptable **outdoor** analog audio and system control channel performance for public safety applications in the presence of anticipated interference in the VHF band. This is roughly equivalent to a 10-microvolt signal with a unity gain antenna.

In this case, the Offeror is requested to describe the level of coverage guaranteed. Configuration C will be rated lower in the evaluation than either Configuration A or B, and rating will be variable commensurate with the level of coverage guaranteed. If 14 additional LMR sites are necessary and not sufficient, the Offeror shall substantiate why the selected sites were chosen and why other areas were left without coverage (if any).

6.2.1.5 Coverage Charts and Analysis

The Offeror is expected to include in their proposal a detailed description of the propagation models used, and the assumptions made in preparation of the charts.

The Offeror shall provide coverage charts in their proposal, as supporting documentation. Each chart should be composed of a single composite area delineating the coverage objectives specified in the Radio Coverage Performance Objectives section above for each Communications Zone. The composite area should be overlaid on a map with the specified Service Area and Communications Zones clearly defined.

The coverage chart shall identify all areas within the Service Area or Communications Zone that do not meet the coverage objective. Identified coverage deficiency areas in the Service Area are to be taken into account when constructing the composite 95% area reliability boundary. (Note that the composite area is not the 95% reliability contour, but rather the delineation of an *area* over which the Offeror estimates the reliability of coverage ~~for the specified building loss condition~~ will equal 95%.)

The coverage chart may contain shaded or crosshatched areas within the Service Area that do not meet the specified ~~requirement~~**objective**. Shaded areas in the Service Areas should only be used to indicate potential coverage deficiencies and should be taken into account when constructing the composite 95% boundary for each area.

All areas within the defined Service Area, and Communications Zone s including areas that do not meet the coverage requirements, are to be considered equal when selecting random coverage test locations. The coverage chart will be used as supporting documentation only and will not be considered a part of confirming or guaranteeing that the system will meet the coverage specifications.

6.2.1.7 Coverage and Access Guarantees

This section contains terminology and abbreviations that are described more fully in the TIA/EIA TSB-88A Document for modeling, simulation, and empirical verification of wireless communications system performance. The SI is expected to ~~provide~~ **meet** coverage **objectives** within the Coverage Zones as shown in Appendix A. The coverage to be provided within each Communications Zone is described in the following terms:

- Mobile and portable VHF Channel Performance Criterion (CPC) is established to be a 31dBu median field strength taken over a minimum 40-wavelength distance and a concurrent confirmation that system access is provided from the test location.

- Control Station CPC is established to a 20 microvolt signal at a minimum of 95% of the time.

- Service Area Reliability (SAR) is the percentage of the test locations within the Coverage Test Sector that meet or exceed the CPC as tested, taking into consideration the building loss factor and coverage objective within the Coverage Test Sector (ULSA).

It should be noted that the Coverage Acceptance Test should return test results that respond to the above terms. Acceptance will consider if the CPC is indeed provided to the guaranteed SAR within the specific Coverage Zone (ULSA).

Considerations such as the following are specifically excluded from the guarantee and the test, although the SI may, at their option, include them in the calculation for SAR (for coverage predictions):

- Tile Reliability Margin (TRM) described as the margin, in dB or in percentage, which the SI might include in order to increase the probability of achieving the required CPC in a specific measurement tile.

The SI is advised that this guarantee is independent of their choice of propagation model, terrain database, statistical prediction method, or coverage charts. The Coverage Guarantee shall rely exclusively on measured values of field strengths and system access after the system has been installed.

At acceptance test time, these availability numbers will be compared directly with measured values to establish compliance. The guarantees provided in this form will constitute the sole criteria for evaluating proposed coverage.

The SI is expected to perform coverage verification tests as described herein. The COV Project Manager and the Engineer will then perform coverage confirmation tests on a statistical sample of locations and areas within each Communications Zone. The system will be deemed satisfactory and accepted only if both the verification tests and confirmation tests are passed. In the event there is a discrepancy between the verification tests and the confirmation tests, the discrepancy will be resolved before proceeding further. The SI shall state the coverage guarantee for digital radios separately, as shown in the Table 6-2.

6.2.1.8 Test Equipment

The SI is expected to provide all test equipment**, software,**-and personnel necessary to demonstrate the viability of the system. Test equipment should meet all manufacturers' test procedure requirements and be in current calibration. Any equipment or systems deemed by the SI to have been changed since previous testing or demonstration should, at the SI 's option, be re-tested under field conditions. As part of the proposed Acceptance Test Plan (ATP), the COV Project Manager and the Engineer should be given a list of test equipment, the latest calibration dates, and a description of how the equipment is planned to be used, for their approval.

The equipment required for Coverage Testing is to include, at a minimum, a receiver capable of monitoring frequencies in the 150 MHz. band and any other band wherein coverage testing might occur for the Mobile Data System, a GPS receiver, appropriate antennas, and a PC with data collection and coverage correlation software installed. The test equipment is to be portable and derives its input power from an automobile's electrical system. Coverage testing shall be performed in the vehicle purchased the previous year for VSP patrol units.

It is the COV's intent to have the Engineer monitor Coverage Test activities, analyze coverage data, and assist the SI in preparing the final Coverage Test Report. It is also the COV's intent to perform coverage confirmation tests**,using the test equipment and software supplied by the SI in section 6.2.1.8** -on a statistical sample of locations and areas within each Communications Zone. **COV will retain this equipment and software for the life of the contract or partnership** The system will be deemed satisfactory and accepted only if both the verification tests and confirmation tests are passed. In the event there is a discrepancy between the verification tests and the confirmation tests, the discrepancy will be resolved before proceeding further.

The Offeror is expected to include the estimated duration of the Coverage Acceptance Test in the proposal. Although the coverage specification is written in terms of field strength, other more accessible parameters may be measured in lieu of field strength, if a direct relationship between field strength and that parameter is demonstrated and recorded as part of the measurement procedure. The detailed test procedure is expected to carefully describe this relationship. During the acceptance test, the SI may require measurements to be made to and from specific locations. The purpose of making such measurements is to characterize the coverage of specific areas within the Service Area. These directed measurements should be recorded and presented in the test report. Only those locations already included in the "randomly selected locations" described in the detailed test plan will be used as part of the statistical proof of performance.

Test routes, as defined in this specification, are to follow all areas accessible to the COV. Testing on private property is expected to be coordinated with the COV Project Manager. If, for any reason, the SI finds it necessary to conduct tests on private lands, in restricted areas, or other areas not normally open to public access, the matter of gaining access should be directed to the COV Project Manager. The intent is also to test coverage throughout the Commonwealth whether the area is accessible via a standard vehicle (four wheel drive or outboard water boat), or not. Exception to using a standard VSP vehicle for testing is allowed when necessary with the concurrence of the COV PM and Engineer. COV has the ability to access areas not normally accessible via a standard vehicle. The SI is expected to make application with at least thirty (30) days of advance notice of the dates and locations where such access is required.

SI developed coverage tests shall demonstrate that the proposed system meets or exceeds the specifications within a specified coverage area.

The same procedure is to be used for retest.

Since this is an operational system, retesting for any reason will be treated as a new test, with scheduling, process, and routes subject to the approval of the COV Project Manager and the Engineer.

G. The SI is expected to submit a new route for the COV Project Manager and the Engineer's approval. The new route should contain, at a minimum, the same number of test points and Service Area distribution as the original test.

H. Data resulting from the re-test should be combined with the original test data and cumulative coverage and access percentages should be computed as if one test had been performed.

Further retests may be performed at the SI's discretion and expense (and subject to the costs incurred to the Commonwealth and the Engineer as described above under "Acceptance Default"). All re-tests are to be performed as described in this paragraph, and the SI shall notify the COV Project Manager and the Engineer of all re-tests.

6.2.1.12 Sample Coverage Test Procedure and Advance Preparations

COV desires that the LMR system will meet the coverage objective of 95% to and from mobile units operated within the Service Area and the Communications Zones as described herein.

One method of testing system compliance with the Coverage ~~Guarantee~~ **Objective** is as follows:

Pre-test preparation and analysis:

In order to achieve a statistically sound representation of coverage throughout the COV, sampling criteria must be created, mapped, and analyzed. The following analysis forms a baseline for which field tests can be conducted in such a way as to provide reliable and meaningful data.

This degradation is based on a comparison with the fixed receiver connected to a dummy load. The 12 dB SINAD sensitivity is defined as that signal necessary to provide 12 dB SINAD in the presence of local noise. The 2% BER sensitivity is defined as that signal necessary to provide a 2% BER in the presence of local noise.

The effects of co-channel noise or interference that may be generated off the site are not the responsibility of the SI, except to the extent that the SI's equipment is susceptible to the noise or interference due to not being installed using good engineering and implementation practices, in which case the SI is expected to resolve the situation. Should interference be identified, the SI ~~is expected to~~**shall** analyze the interference, identify solutions, and provide a report to the COV Project Manager and the Engineer. The COV expects the SI to perform and document a site survey that investigates noise and interferers prior to a site being recommended to the COV for use.

Further, the high capacity LMR system operation should prevent degradation or causing the system to be degraded. Degradation is defined as being the reduction of 12 dB SINAD sensitivity by more than 3 dB under duplex operation and when connected to the actual antenna. This specification is intended to eliminate the effects of on- or near-channel transmitter noise and intermodulation products, which might emanate from the high capacity LMR system. The SI is not responsible for rectifying off-channel interference effects such as receiver desensitization, receiver generated intermodulation, or receiver spurious signal sensitivity, except to the extent that the Offeror's equipment creates such interference due to not being designed or installed using good engineering and implementation practices. The SI shall be responsible for identifying the above anomalies. The Offerors are expected to provide robust designs that consider the minimization off-channel interference effect such as receiver desensitization, receiver generated intermodulation, or receiver spurious signal sensitivity. Should such degradation be identified during the life of the contract or post-acceptance agreement, the SI ~~is expected~~**shall** to analyze the degradation, identify solutions, and provide a report to the COV Project Manager and the Engineer.

In Scenario 1, the responsibility for compliance with interference objectives will apply only to co-located equipment in service at that location at the time of System Acceptance. The responsibility for identifying, analyzing, and recommending solutions to interference problems will apply for the life of the contract or extended agreement. In Scenario 2, the SI shall be responsible for identifying, analyzing, and rectifying interference problems to maintain compliance with all interference objectives for the life of the partnership.

6.3.2 Transportable ~~Cell~~ Site

COV desires a transportable LMR ~~Cell~~ site. **The transportable LMR site will be used to provide mission critical portable radio communications. The transportable LMR site shall be provisioned to allow communications autonomy, power self-sufficiency, command control capabilities, mobile data terminal, and multiple interface connections including telephone, T1 and Microwave. The SI shall provide full COV fixed site LMR interoperability the equipment necessary to provide critical communication links to the STARS Intranet.** The transportable site can be mounted in a shelter that is part of a self-propelled vehicle or in a shelter that is mounted on a towable trailer. If the transportable site is to be towed, the Offeror is expected to recommend the type of vehicle needed for meeting the towing capacity, however it must conform to the Virginia DOT code. If a trailer is offered it must have a grounding point and be Virginia DOT lighting certified. Trailers must have four corner, drop down leveler jacks.

In either case, the shelter must be weatherproof and contain heating, air-conditioning, and lighting. The shelter is to be provided with a ground loop that is connected to the vehicle or trailer frame. The roof must support walking and there is to be a ladder included. The HVAC package must be able to support LMR base station equipment, antenna multicoupler and combiner equipment, site control and computer equipment, dispatch console equipment, and up to four operators. All non-rugged zed equipment shall be shock mounted. Transport covers shall be placed over any items that may be rendered inoperable if a loose object strikes the equipment while the trailer is in motion. For example if a computer monitor is placed in the transportable ~~cell~~**site**, a cover over the screen protecting it is required. Operators must have access to the Mobile Data System. Base station equipment will be sized to support two conventional communication channels in the 150 MHz frequency range and a five (5) channel 800 MHz trunked subsystem.

In addition, the Transportable ~~Cell~~ Site is expected to contain a complete five channel 800 MHz trunked system, using the COV's frequencies. The Transportable ~~Cell~~ Site is expected to be equipped with fifty 800 MHz portable radios and charging stations, configured to work with the ~~Cell~~ **Transportable** Site. In addition, a method of interconnecting the ~~Cell~~**Transportable** Site with the LMR network through the nearest LMR site is desired to be provided such that operation using the 800 MHz trunked ~~Cell~~**Transportable** Site is identical to the VHF LMR network. The Offeror is expected to provide in the proposal a detailed technical analysis of this ~~Cell~~**Transportable** Site including drawings and descriptions.

The Transportable ~~Cell~~ Site should have interface capabilities for telephone, microwave,

and to its own self-contained antenna system.

The ~~Cell~~**Transportable** Site will have provision for its own portable tower. The 100-foot tower assembly may be mounted on an independent trailer and must be capable of withstanding 70 MPH winds. A lattice design is preferred. Motor drive or hydraulic tower raising and lowering equipment is preferred. Manual winch raising and lowering can be provided if load actuated brakes are installed for safety. The tower trailer must have provision for cable storage, raising and lowering equipment, corner leveler jacks, a common grounding point, tower and antenna maintenance tools, and anchoring equipment. Generator power will be the main source of electricity and provisions will be made to connect to a stationary source of power. A centralized distribution panel containing facility circuit breakers, ammeter, frequency indicator, and a voltmeter will be included. A test selector switch(s) will be surfaced mounted on the panel to select independent readings, per phase of frequency, current, and voltage. This panel must be accessible from the inside of the shelter. A minimum of six 20AMP twist lock receptacles are to be mounted in the ceiling and a minimum of six duplex 15 AMP receptacles are to be evenly spaced around the wall perimeter. Lighting may be florescent if anti-shock fixtures are used. A transfer switch that allows generator or stationary power to be used in the shelter is to be accessible from within the shelter. The generator is to be powered from diesel with both Automatic and Manual starting provisions. Fuel provisions are to be planned to allow for 36 hours of continuous service. It is recommended that LP not be used for transportable sites because of availability in emergency situations and the restrictions of transporting LP gas in tunnels.

In addition to the above-described Transportable Site, the Offorer is to include a Disaster Recovery Transportable ~~Cell~~ Site (DRT~~C~~S) that is to be used by VSP technicians (Scenario 1) in the event that a LMR site is lost. **The DRTS is to be used as a temporary backup site in the event that a situation disables an existing fixed LMR site. The DRTS is envisioned to be a "drop-in" site that can restore fixed site capabilities in time of fixed site perils. The SI shall provide for the interoperability and LMR interfaces found in the fixed LMR sites, including leased data line and Microwave provisions (including telephone).** DRT~~C~~S is to include at a minimum a 5 channel, 100W VHF repeater suite with an RF cabinet containing hybrid multiplexer and combiners, site controller computer, telephone interface panel, 4 RF cross connect radios with power supplies, spare rack for additional cross connect radios, MDC and radio interface equipment, and an administrative P/C. The DRT~~C~~S shall be equipped with an AC generator and transfer switch and a generator fuel tank with a 36-hour capacity. It is recommended that LP not be used for transportable sites because of the restrictions of transporting LP gas in tunnels that traverse underwater. The SI may consider a separate trailer for transporting the generator. Consideration must be given to transporting the generator on wet and icy roads and in flooded areas.A 100-foot crank up tower is desired.

- Virginia Department of Emergency Services (VDEM)

  VDEM currently operates 4 Conventional Orbacom consoles at their Dispatch Center in Richmond and plans to expand by one additional dispatch console.

- Department of Military Affairs (DMA)

  DMA currently operates one Motorola Dispatch Console located at ~~the at~~ Fort Pickett in Blackstone, VA.

- Department of Forestry (DOF)

  DOF currently has dispatch operations in Charlottesville and plans to expand to a Dispatch Center.

- Department of Game and Inland Fisheries (DGIF)

  DGIF currently operated one Conventional Consoles at their Dispatch Center in Richmond.

- Marine Resources Commission (MRC)

  MRC currently operates one Dispatch Console at Newport News.

- Virginia Department of Transportation (VDOT)

  VDOT currently operates two Orbacom Dispatch Consoles located in Arlington and Virginia Beach

Installation for the above mentioned agencies shall me**e**t the following requirements: Consoles shall be installed using existing office furniture and power. Additional internal communications wiring will be required to connect consoles to commercial telecommunications or microwave radio equipment. It is desired that the SI describe in their proposal what method of connection is recommended.

Virginia's IFLOWS consists of two phases using three separate but parallel subsystems:

Phase 1, which is in the Southwest part of Virginia (Refer to Figure 6-3):

1. 300-baud data message: The 300-baud rainfall/stream gage data is transmitted, via a VHF link using hydrologic frequency 169.500 MHz., to a VHF receiver at one of five VSP Western mountaintop radio sites. Several VSP dedicated microwave channels are used to carry this raw rainfall data information to a VDEM computer located at the Virginia State Police Headquarters.

2. 1200-baud data collection information/operation: The VDEM computer tabulates the raw data and returns the information to a 1200-baud data channel for distribution to the jurisdictions, via the VSP Microwave network, to one of the five VSP Western mountaintop radio sites. This data is transmitted from the VSP site to the jurisdiction via a VHF radio.

3. Multi-jurisdictional voice operation: Parallel to the data operation, there is a VHF radio at five VSP Western mountaintop radio sites and each local jurisdiction used for voice communications. This is configured in a "party line" operation using a bridge located in the VSP Headquarters transmitter building. This voice operation allows any local jurisdiction with IFLOWS to be heard simultaneously at all other jurisdictions. It is intended for voice communications in emergencies when other forms of communications, ~~ie~~**i.e.**: lease lines, are down. On a ~~day to day~~**day-to-day** basis it is primarily used for maintenance personnel. Voice traffic that is transmitted to/from VDEM is via a dedicated line to the Microwave system.

Phase 2, which is in the Northwest part of Virginia (Refer to Figure 6-3):

1. 300-baud data message: This data is transmitted, via a VHF link using hydrologic frequency 169.500 MHz., directly to a receiver at the local jurisdiction. The raw data is tabulated in the computer at the local jurisdiction. In certain areas where the rain gauge transmitter cannot directly communicate to the local jurisdiction, there are several repeaters utilized, located on various mountaintops, which briefly store and then forward the data information on 169.500 MHz to the jurisdiction.

This trade-off evaluation requires a means of predicting spares sufficiency for any assembly level of sparing being considered.

One formal process for predicting the optimum number of spares to be supplied for each type of assembly can be calculated from the Poisson Probability Law as follows:

$$P(x \leq c) = e^{N \bullet \lambda \bullet \tau} \sum_{i=0}^{c} \frac{(N \bullet \lambda \bullet \tau)^i}{i!}$$

Where P is the probability that spares do not run out during the life of system operation and N is the number of the same assemblies in the system, λ is the failure rate per hour based on Mean Time Between Failures (MTBF), and τ is the system operational time. Typical spares sufficiency probabilities range from 0.990 to 0.999.

The Offeror is expected to provide a Spares Provisioning Matrix, which shows the assemblies that are to be considered as critical and require spares, the associated MTBF for these assemblies, and the form of supply (stocked spare or available loaner).

An example analysis is shown for a 150MHz Base station:

1. The Base station has a MTBF of approximately 11,230 Hours. 1/MTBF = .000089 Failures/Hr

2. The communication system's required life is 6 years, or 24 Hrs/Day • 36~~0~~**5** Days/Year • 6 Years = ~~5184~~ **52560** Hr.

3. Assume that there are 15 Base stations in the operating area.

4. Calculate $\mu = N \bullet \lambda \bullet \tau$ = 15 x .000089 x ~~5184~~ **52560** = ~~6.92~~**70.17**. This is the expected number of failures over the life of the system.

5. It is desired to have a spare sufficiency probability of 0.99~~5~~**0**

6. Solve the Poisson Probability Law for c, which is the minimum number of spares required

   $P(x \leq c) = e^{\mu} \sum_{i=0}^{c} \frac{\mu^i}{i!} = 0.995$**0**, and c can be looked up in a Poisson Probability Table or calculated.

   c = ~~14~~**90**, which means that there is a 99.5**0**% probability that ~~14~~ **90** spare Base stations will maintain the system for its operational life of 6 years.

The above analysis shows that ~~nearly~~ **6 times** as many spares are required as there are original operational units. Obviously, this situation is unrealistic based on the economics of having nearly a ~~1~~**6**00% backup capability. Since the system's operational time is fixed, and it is not wise to reduce the spare sufficiency probability; the only remaining variable is the equipment's MTBF.

If the SI could provide the same Base station with a MTBF of ~~50,000~~**112,300** ~~Hrs, the spare requirement would drop to~~**12** ~~5~~ units. To get the spare requirement down to ~~2~~ **5** units, a MTBF of ~~240,000~~**200,000** Hrs. would be required (typically, power supplies have MTBF in the order of 300,000 Hrs). **The point is to design system components with the highest MTBF possible, and to use proven analysis to arrive at a realistic spares provision plan.**

Suppose that the SI **provides a Base Station with 200,000 hour MTBF. The above analysis shows that 5 spares will hold up the system for 6 years. But consider what happens if the SI decides to offer only 3 spares for emergency repair. Using the data above, the expected number of failures over the life of the system is 3.492 failures. Using the Poisson Probability function, with c=5, the probability of spares sufficiency is .794. This says that there is a 1-.794=.206, or a 20.6% probability of running out of spares.**~~is only required to keep 7 loaner spares available for emergency repair (half of the calculated number of 14). Using the data above, the expected number of failures over the life of the system is 6.92. Using the above formula, with c=7, the probability of spares sufficiency is .6135. Therefore, the probability that 7 spares is not sufficient to support the system for life is 1-.6135=.3865. In other words, there is a 38.65% probability of running out of spares.~~

If only 3 spares are kept on hand, the probability of spares sufficiency

drops to .445. Therefore, the probability that 3 spares are not sufficient to support the system for life is 1-.445=.555. In other words, there is a 55.5% probability of running out of spares. The SI is urged to keep the results of this analysis in mind when developing a spares provisioning plan in addition to supporting/supplying existing COV maintenance organizations (Scenario 1).

~~Furthermore, spare provisioning must consider not only the reliability of the product, but the way the product is used in its designed application. Day-by-day use subjects LMR products to adverse events such as severe shock, lightning, gunfire, ice, destruction of patrol vehicles, and high winds. Replacement will be inevitable, and the offeror must~~

~~address these events in their plan.~~

The above examples are provided to emphasize the importance of how an analytical process can accurately determine the required number of spares. The Offeror should observe such a process in making its decision on how to enter into spares provisioning contract with the COV.

This analysis leads towards two points of concern that are of prime importance to COV:

1. Overall system reliability (high MTBF) as it relates to design, component selection, vendor control, and professional manufacturing skills.

2. Availability of spare assemblies and a plan to immediately make available spares when in demand.

Whereby, it is the obligation of the SI, to obtain equipment that is well designed, reliable, and of high standards of professional manufacturing skills, it is also the SI responsibility to make available to COV a sufficient number of spares that meet the above criteria. Spares must be provided on demand and can be in the form of purchased items or loaners from the SI. The Offeror shall provide a plan for spare provisions in detail. This plan shall include the financial options for spare provisioning, realistic MTBF data that is verifiable, and any business options that may be jointly acceptable to the COV and the Offeror.

Should the Commonwealth elect Scenario 1, it is their intent to provide repair to subassemblies at a component level. The Offeror is expected to provide, as a separately priced option, a schedule of spare parts, training, test fixtures, and special test equipment needed outfit 29 maintenance service vehicles, 4 tower maintenance vehicles, 3 equipment installation crews, 8 regional service centers and a Richmond depot center. For the depot center, 3 fixed equipment, 7 portable equipment, 10 mobile equipment and 3 board level fixed equipment test equipment packages are required by the COV.

6.3.16 Aircraft Operations

COV has a variety of fixed and rotary wing aircraft in service.

The Offeror is requested to provide a detailed description of their approach to aircraft operations with respect to their proposed technology and protocols. Consideration should be given to co-channel interference and frequency re-use, operations in-flight as well as at the scene, altitude dependent operations, and operations in the high-capacity control environment envisioned for the system. A single control head is desired for all communications devices used in Aircraft. All federal and state laws, regulations, and specifications shall apply to airborne radio equipment.

The Offeror shall, as a priced option (equipment and installation priced separately, Scenario 1), provide the per-unit cost for ~~forty (40)~~**twenty-eight (28)** installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a trunk-mount mobile radio. The radios and installation shall be compliant with federal regulations. This cost shall include the cost of any FAA certification required, and all accessories including, but not limited to, FAA approved control head, antenna, and integration into the aircraft communications system.

The ideal solution to incorporating LMR system radios in aircraft would be to supply components that are currently FAA certified for aircraft installation. In the event that radios are not available that meet this certification requirement, the Offeror shall describe in their proposal the process to be used to obtain limited FAA certification for the number of installations required.

The Offeror is expected to provide as part of their proposal a full description, including drawings and other details of the interface to the aircraft avionics audio distribution panel. Some of the aircraft in the fleet utilize 12-volt DC power and others utilize 24-volt or 28-volt DC systems. If a DC-to-DC converter is required, it must be FAA approved. In addition, the Offeror is expected to provide as part of their proposal an analysis of the anticipated impact of operating an aircraft installed radio at high altitude within a simulcast system. If special ground installed equipment is required, it needs to be described fully, with appropriate cost entries in the Avionics option. Where FAA approved commercially available components (such as antennas) are available, only those will be utilized. For this option, the Offeror shall only utilize an approved FAA repair/installation agency to accomplish the physical installation as well as the aircraft records entries and any other FAA required certification needed according to FAA regulations in effect at the time of installation.

It has been ascertained that such equipment is in current production and readily available from multiple sources. Where details are given, they are for the purpose of ensuring that the Offeror suggests comparable equipment meeting certain minimum standards considered by COV to be essential. These specifications are applicable to new equipment only.

6.4.1.1 Applicable Standards

It is the intent of this specification to act as a baseline in defining the regulatory guidelines and standards for which this communication system is fully compliant. A detailed list of standards is shown in Section 4.

6.4.1.2 Environmental Requirements

In general, equipment should be designed to operate within specifications described in Table 4-1. Any deviations from this environmental requirement are to be specifically identified by the Offeror.

It is desired that all environmental tests results are verifiable by a National Recognized Testing Laboratory (NRTL) or by the Offeror's testing laboratory, if a National Laboratory Accreditation Board such as NAVLAC accredits it. All environmental test data, test results, and statements of conformity **shall** be made available to the COV **Project Manager** and to the Engineer.

6.4.1.3 Intrinsically Safe LMR Equipment

Intrinsically safe equipment has been requested by participating agencies, and such equipment that is offered to the COV shall be labeled accordingly as to meeting the specifications listed in Table 4-1. Table 4-1 lists the Class (vapor, dust, or flyings), Division (normal or abnormal operating conditions), and Group (type of explosive material) for which intrinsically safe testing and manufacturing shall conform.

In addition, the Offerors will be expected to have accessories available to adapt the proposed equipment into a positive-ground 12 VDC and higher voltage automobile power system. Each radio should be provided with a time-out timer to limit the length of conversations allowed. The time-out timer function should be programmable with a simple procedure by a maintenance technician.

The radio should be expandable for operation on the future number of 150 MHz channels. The mobile radio package should meet the following requirements of MIL-STD-810 C, D, E, or F (Please refer to Table 4-1).

COV has a variety of fixed and rotary wing aircraft in service **(Refer to Table 6-4)**. The Offeror is requested to provide a description of their approach to mounting their radios and control heads into such aircraft, and their operational recommendations for such aircraft with respect to their proposed technology and protocols.

COV operates motorcycles, which require communications. The Offeror is requested to provide a detailed description of their approach to mounting radios and control heads in a motorcycle environment, so that they will meet the environmental specifications and the MIL-STD testing in Table 4-1. Please also describe precautions taken to comply with 47 CFR with respect to radiation in a motorcycle environment.

6.4.4.2 Trunk-Mount Radio Specifications

Offerors shall provide, as a minimum, the trunk-mount radio that meets or exceeds the requirements as follows:

- Uses a compatible control head
- Personality programmable using a P/C
- Emergency features standard
- 10.8 to 16.6 VDC system voltage with Negative Ground
- 100% Receiver Duty Cycle; 20% Transmit Duty Cycle
- Alphanumeric display (8 Character minimum)
- Siren and Light Control Buttons on Control Unit
- Meets the Environmental specifications as listed in Table 4-1

6.4.6.2 Dash-Mount Mobile Radio Specifications

SI is expected to provide, as a minimum, the dash- mount radio that meets or exceeds the requirements for the required tier.

6.4.6.3 Operating/Adjustment Controls

The controls provided as part of the radio housing should include a volume control, an ON/OFF switch, a transmit indicator, scan switch, and a system busy indicator. Alphanumeric displays, capable of displaying a minimum of 8 characters, are expected to be provided on all control heads. Noise attenuating headsets shall be provided to operate in a marine environment.

The Offeror should describe controls that will be provided for the various features in detail.

6.4.7 Portable Radio Units

This specification describes hand-held radios operated in a number of configurations:

- As a VHF radio capable of operating in the proposed high capacity LMR voice system
- As a VHF, UHF, or 800 MHz trunked radio capable of operating with the transportable ~~cell~~ site
- As the UHF radio capable of operating with the vehicle repeater

The portable radio should operate in both conventional and high capacity LMR system modes in the indicated. The radio unit shall be small in size and of such a form factor that normal operation can be accomplished with one hand. Each Portable radio is expected to be supplied with an antenna and 1.5 rechargeable batteries and an optional battery pack (clam shell) that allows the use of readily available batteries (e.g. AA) with a minimum of six hour operational life.

H. Direct Phone Interconnect

A direct phone interconnect control should be provided to the console operator. This should allow an operator to access a commercial phone line directly from the console without the use of a separate telephone handset.

It may also be used to answer or initiate a phone call, for phone patch operations, and if possible as an "intercom" between operators on separate systems (systems using separate central electronics equipment packages) where there is no data link.

All the functions, which would be done by this external phone, should be self-contained within the console system. This direct phone interconnect should allow access by the console operator to any phone trunks connected to the trunking controller for non-fixed unit interconnect. The number of trunks required is to be determined by the Offeror based on the Offeror's traffic and loading analysis.

The direct phone interconnect control should provide an OFF HOOK/RINGING key and a HOLD key. When a call is received the word "Call" should appear in the telephone indicator. If a headset is used, the direct phone interconnect should revert to duplex operation.

If any other microphone is used, the direct phone interconnect should revert to simplex operation to prevent acoustic feedback.

The operator should be able to place a call from the console using the console's DTMF signaling capabilities and the signaling buttons. "Speed Call" type dialing may be performed using single button signaling options to access frequently called phone numbers. There will be a minimum of twenty-four (24) speed call numbers available.

I. Automatic Telephone Dialing Interface

A description of the existing system interface is as follows: An RS-232 serial line connection exists between the CAD and Orbacom radio console system. This connection is used for the exchange of outgoing call initiation messages and, incoming on/off hook and call status messages. When an outbound call is initiated from a CAD terminal, the CAD system creates an Orbacom dial

command continaing the initiator's console position number, specific outgoing telephone line to use, and the number to dial. The command message is assembled in Orbacom TDM-OP260 format and sent to the Orbacom, which subsequently initiates a call on the specified line. Once connected, calls terminations are performed by manual interaction with the initiator's Orbacom communications control screen. Call status messages resulting from dial commands and manual terminations are used by the CAD system to maintain an internal line availability table (Refer to Figures 6-5 and 6-6).

The proposed radio console system shall include the capability to dial outbound calls in response to command messages received through an interface with the VSP CAD system. Call logging is a required ancillary function for all outbound calls.

The Offeror is requested to provide a technical description of the interface including physical properties (RS-232, USB, etc) and command message requirements.

~~I.~~**J.** Caller ID Interface

An overview of the existing Caller ID feature is described as follows: ~~Caller ID~~ **ANI/ALI** information is ~~sent to~~**received by** the CAD system via an RS-232 interface **from a stand-alone Caller ID unit** and stored as most-recently received information. When a CAD operator answers the telephone call, the Orbacom system provides answering position information to the CAD system on the console system interface ~~(the VSP CAD interface is described in Appendix I).~~ Caller ID and Orbacom position information messages are matched up and, based on answering position, presented to the appropriate CAD terminal screen. CAD operators can then transfer the Caller ID information into an incident generation screen mask. An accumulative history of Caller ID information is maintained in a log file.

Provision for Caller ID and Caller ID Message Logging is desired. The Offeror is requested to provide a technical description of the interface (RS-232, USB, etc) provided.

~~The direct phone interconnect control should provide an OFF HOOK/RINGING key and a HOLD key. When a call is received the word "Call" should appear in the telephone indicator. If a headset is used, the direct phone interconnect should revert to duplex operation.~~

~~If any other microphone is used, the direct phone interconnect should revert to simplex operation to prevent acoustic feedback.~~

~~The operator should be able to place a call from the console using the console's DTMF signaling capabilities and the signaling buttons. "Speed Call" type dialing may be performed using single button signaling options to access frequently called phone numbers. There will be a minimum of twenty-four (24) speed call numbers available.~~

K.~~J.~~ Instant Recall Recorders

The Commission on Law Enforcement Agency Accreditation (CALEA) recommends instant recall recorders for both telephone and radio. Some newer console equipment and telephone terminal equipment provide for instant recall recorders as a standard feature. From the standpoint of officer and citizen safety, being able to rapidly recall telephone and radio traffic is essential. The Offeror shall propose instant recall recorders to meet this requirement.

Solid-state instant recall recorders shall be provided. The recorder should be located in the operator console and the recorder's control switches should be integrated into the console furniture. The instant recall recorder should be wired to record either the console telephone audio or the radio select audio and to replay that audio upon demand through the recorder's speaker. The Offeror is expected to include one Instant Recall Recorder for each console position. The Offeror may provide a common instant recall recorder system that appears at all positions, including a central hard drive or other memory medium, in which case are to be described a detailed technical description of the system. This description shall include message length capabilities, time constraints, channel capacity, interface connectivity, and media type.

6.4.14.10 Console Specifications

For a detailed description of the existing VSP dispatch and console configurations, the SI is encouraged to review the "VSP Infrastructure Evaluation Report", to be provided by the Contracting Officer.

Additional consoles are to be used by the Capitol Police, Department of Game and Inland Fisheries, Marine Resources Commission, Virginia Department of Emergency Management, Department of Forestry, Department of Transportation, and Department of Military Affairs. Pictures and descriptions of these operations, as provided by the agencies, will be provided by the Contracting Officer. The SI is shall develop a plan for dispatching and the effects of data transfer throughout the COV via the dispatch centers. Any VSP division dispatch center or participating agency dispatch center should be able to dispatch another of its dispatch centers. Specifically, the SI shall describe how dispatching can be transferred from one agency center to another.

The console equipment should meet or exceed the following specifications. Line specifications apply only to High Tier, or Mid Tier if connected to the system via voice circuits. **It is highly desired that the radio console have the capability to send and receive email (including MS Office documents) via the Intranet to MCTs and other agency dispatchers. The SI shall provide a plan detailing the operation of email.**

A. End-to-End Specifications

From the line input terminal to the speaker and from the microphone to the terminal:

Frequency Response	300 to 3,000 Hz, +1, -3 dB at less than 2% THD
Hum and Noise	Greater than 50 dB below output
Cross Talk	Greater than 60 dB below output levels (for a fully loaded system).
Gain Control	AGC, less than 3 dB change for a 35 dB input change

While status, activity, alarms, and other system information is desired to be available to a number of authorized users, control and diagnostic operation is expected to be very carefully controlled, and should be physically limited to access by only these Network Console positions. The Offeror is requested to provide a detailed description in their proposal of the subsystem that is intended to provide this function, including diagrams and description.

A printer will be provided to produce a hard copy printout of the system activity data after conversion into intelligible form. The system manager and control system should provide its input/output functions at various supervisor positions in the system.

To the extent possible, the hardware and software should be off-the-shelf.

6.4.16.1 Alarm and Diagnostic Subsystem

The purpose of this section is to describe the overall intent of providing an integrated alarm subsystem, that will support the operation of the COV Communication system, and to define the its specific requirements. COV envisions this will be consolidated as a network function of the LMR systems (network) manager, however the Offeror may propose a different configuration more suitable to their standard offering.

Reliability is a prime consideration in the COV system. It is critical to continuously monitor various critical points within the system in order to provide a snapshot of, the overall status or health of the system. For this reason, an alarm subsystem ~~is expected to~~**shall** be implemented to provide accurate, detailed system status information essential for reducing the time it takes to identify and resolve system problems. The Offeror is to propose a discrete transmitter site security camera system, as an option, which can be operated in concert with the LMR alarm system. It is desired that the individual site cameras be displayed to the VSP dispatcher at the respective division and all cameras be displayed at the two network control centers. If this is proposed, the Offeror shall also clearly define the loading such a security system will have on the network.

A gain antenna may be considered if the gain in the horizontal direction can be maintained within 1 dB over the required bandwidth (at least 10 MHz). If the Offeror plans to use a gain antenna, they are requested to provide measured data that confirms the antenna can maintain this gain in the horizontal direction.

A. Standard Mobile Radio Antenna

The antenna radiating-element should be removable and replaceable without disturbing the antenna mount. A minimum of fifteen (15) feet of antenna cable should be supplied. The antenna assembly should be suitable for mounting on a vehicle roof, a vehicle trunk deck, ~~a~~ or other similar locations. Optional "no-ground plane" antennas should be available for non-metallic surfaces. Antenna mounting locations on all VSP vehicles shall have COV PM concurrence. Magnetic mount antennas shall not be used.

This antenna is also acceptable for a vehicular adapter

B. Disguised Mobile Radio Antenna

The disguised mobile antenna should be similar in design and appearance to cellular mobile antennas or replace the AM/FM broadcast antenna. A minimum of fifteen (15) feet of antenna cable should be supplied.

The Offeror shall describe how they intend to mount VHF (high and low band), CB, cellular, and UHF antennas next to each other. The Offeror shall also describe how they will accommodate vehicle equipped with LOJACK.

6.4.23.5 Portable Radio Antenna

The portable radio antenna should be supplied as part of the portable radio unit. The antenna on a VHF portable reacts very differently because of currents generated in the radio itself and in the human body. The Offeror is urged to provide an antenna efficiency number for portable in hand, at head level and at the waist level.

Routine verification of simulcast alignment should be made possible by using a single maintenance technician, preferably at a single location. Re-alignment may require more than one technician at more than one location. The Offeror shall describe the procedures and facilities for routine verification of system alignment, re-alignment, and re-equalization.

The SI ~~is expected~~**shall to** provide to the COV Project Manager and the Engineer for approval detailed alignment verification procedures and re-alignment procedures no later than ninety (90) days prior to the scheduled beginning of the system acceptance test. It is recognized that minor adjustments to procedures and facilities may be necessary after submission of the detailed procedures and before full system acceptance.

The COV Project Manager and the Engineer will be involved throughout all sub-system and system alignment procedures. The Engineer will review all preliminary and final alignment procedures and reports, and make recommendations to the COV Project Manager.

6.5.1.2 VSP Dispatch Control Centers

The seven Dispatch Control Centers will remain at their present locations. Section 12 shows modifications to the VSP Control Centers to provide for required expansion. The existing VSP Dispatch Centers are equipped with main and standby electrical power, overhead lighting, and is environmentally controlled. The Offeror is expected to advise on whether the floor space described in Section 12 will be adequate for the Dispatch Center electronics and system manager equipment.

COV desires that the current Orbacom consoles be upgrade and re-used if economically practical. If not, the existing telephone/radio consoles should be replaced with new consoles for the upgraded 150 MHz LMR system. The Offeror should propose the quantity of consoles describe herein to control the radio channels and groups, and telephone lines required by the system. Each console should be expandable, with the addition of control modules only, to at least 50% more than the number of radio channels or groups required at that position. Each console should have an interface to operate a Logging Recorder.

6.5.1.5 Radio Interference Performance Objectives

Radio equipment purchased under this specification should be configured and installed so as to minimize interference to or from other co-located equipment.

In all cases, equipment provided and installed should meet the system specification described in the earlier section titled "System Design".

6.5.1.6 Radio Facilities Acceptance Test

The SI is expected to provide authenticated inspection and factory test documentation for all new radio equipment supplied, showing that the equipment meets the specifications.

All equipment shall be subject to passing independent verification of complete acceptance **and performance** testing by the COV Project Manager and the Engineer. The SI shall provide staff and equipment assistance, and to include time in the schedule for this verification.

The following minimum equipment tests should be performed and documented on the repeater stations after installation and prior to commencement of the Radio Facilities Acceptance Test:

A. Transmitter frequency.

B. Transmitter deviation.

C. Transmitter forward and reflected power.

D. Combiner forward and reflected power.

E. Receiver frequency.

F. Receiver 12 dB SINAD sensitivity. 20dB quieting

G. Local operating controls

In the event that satellite receivers are provided, the receiver tests described above are to be performed on those receivers. The LMR system fixed equipment is assumed, for the purposes of this specification, to operate as an integrated package. It is therefore expected that this equipment also be tested as an integrated package. The Engineer will on demand witness all forms of acceptance testing and will advise the COV Project Manager of all testing progress, including scheduling arrangements, detailed failure analysis, and test status.

The Facilities Acceptance Test procedure should conform to the following general requirements:

A. The equipment should have been turned on, aligned and operational prior to beginning the acceptance test.

B. All equipments and equipment components, both main and standby, should be exercised during the course of the test.

C. Systems tests should include end-to-end tests demonstrating that the objectives described in the "System Performance" paragraph, are indeed met.

D. All standard system functions and failure modes, including continued system operation within the limits as defined for single mode failures, should be demonstrated. Alarm functions should be demonstrated.

E. The tests should be conducted in such a way as to be repeatable.

F. For acceptance purposes, the tests should be documented by the SI, and may be witnessed all or in part by the COV Project Manager and the Engineer.

G The ~~Engineer~~**COV** will independently test a representative sample of the equipments as part of the acceptance test~~ and provide a report to the COV Project Manager~~. **Mobile radio and control station subscriber equipment shall be tested concurrent with installation and again prior to issuing to the user.** The SI shall facilitate this process by schedule, support personnel, and other support.

H. The SI shall issue a test report in draft form for approval by the COV Project Manager with a copy to the Engineer prior to, and as a condition of, phase or systems acceptance. Within two (2) weeks after approval of the draft report by the COV Project Manager, the SI shall submit eight (8) copies of the Final Report in hard copy to the COV Project Manager with an additional copy to the Engineer.

One (1) copy of the Final Report shall be provided in Adobe Acrobat (PDF) format to the COV Project Manager with an additional copy to the Engineer.

6.5.1.7 Radio System Factory or Staging Test

The radio system (subsystems) is to be assembled in the factory or at a staging area, which will enable faulty equipment to be identified and corrected while still in a factory environment. Results from component equipment tests made during system staging may be used in lieu of making the same tests after final installation, provided there are no modifications of the component equipments between testing and installation. After installation the SI, upon direction of the COV Project Manager and the Engineer, ~~is expected to~~**shall** repeat a representative sample of component equipment tests under actual field conditions to ensure that the performance of the system has not been degraded as a result of shipping and field installation.

It is further expected and encouraged that many of the system functions and failure modes will be demonstrated as part of the system staging. The COV Project Manager and the Engineer may, at the COV Project Manager's option, agree that staging area demonstrations of certain functions or failure mode operation are adequate and need not be re-tested in the final installed configuration.

The Offeror is requested to specify in their proposal the degree to which the system is to be tested at a staging area, and should include the location of that staging area as well as a staging test plan and a staging test schedule.

The COV Project Manager and the Engineer ~~will~~**shall** be afforded the opportunity to witness the radio system factory staging.

- Status Update
- Supervisor Console
- System Maintenance
- System Statistics
- Telephone Interconnect
- Transmission/Message Trunking GID
- Transmit Busy Lockout
- Transmit Grant Tone
- Transmitting With MIC or Headset
- Unit Enable/Disable
- Unprogrammed Emergency
- User Defined Alarms

~~The Engineer~~**COV** will independently test a representative sample of the equipments as part of the acceptance test. The SI shall facilitate this process by schedule, personnel, and other support

~~The Engineer~~**COV** will conduct batch tests, of various system components, per phase of the system's implementation. The batch sizes will be determined by accepted sampling theory methods. If a batch fails, it will be the SI's responsibility to provide a failure report to the COV Project Manager and the Engineer. The failure report will contain pertinent data as to why the failure rate was abnormal, forensic data, and a root cause analysis. Furthermore, the SI shall replace, at their cost, all failed components. System components, identified through batch testing as failures, will be continually monitored by the **COV Project Manager and the** Engineer to assure that quality products are delivered to COV.

In addition, the SI shall facilitate the following activities to be performed by the COV Project Manager and the Engineer as part of the acceptance:

- High Capacity LMR System Visual Inspection
- Grounding Inspection

6.5.2 Compatibility/Interoperability Demonstration

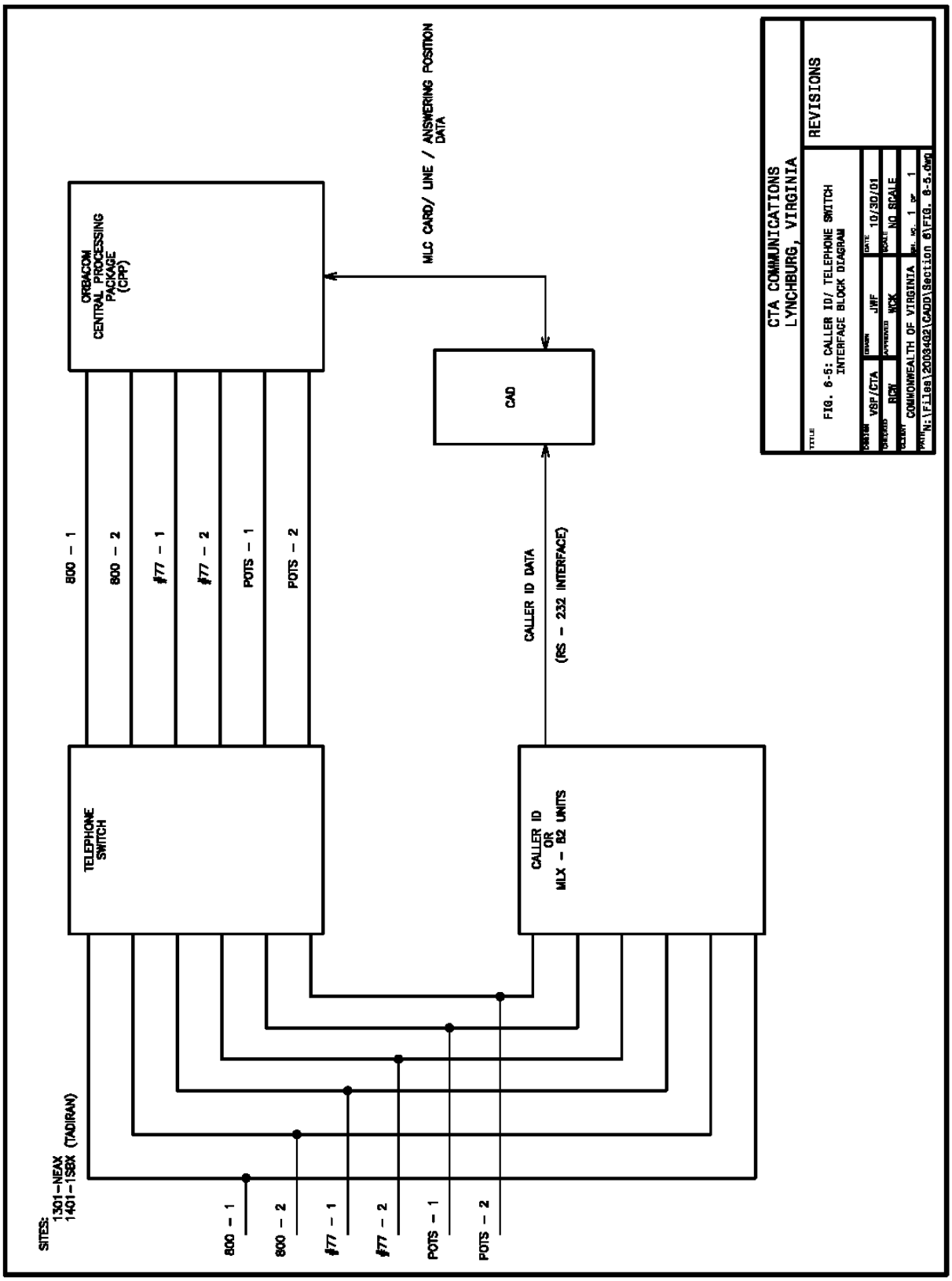
The Offeror should include in their Acceptance Test Plan a demonstration of the interoperability and compatibility with the foreign systems specified in Appendix D.

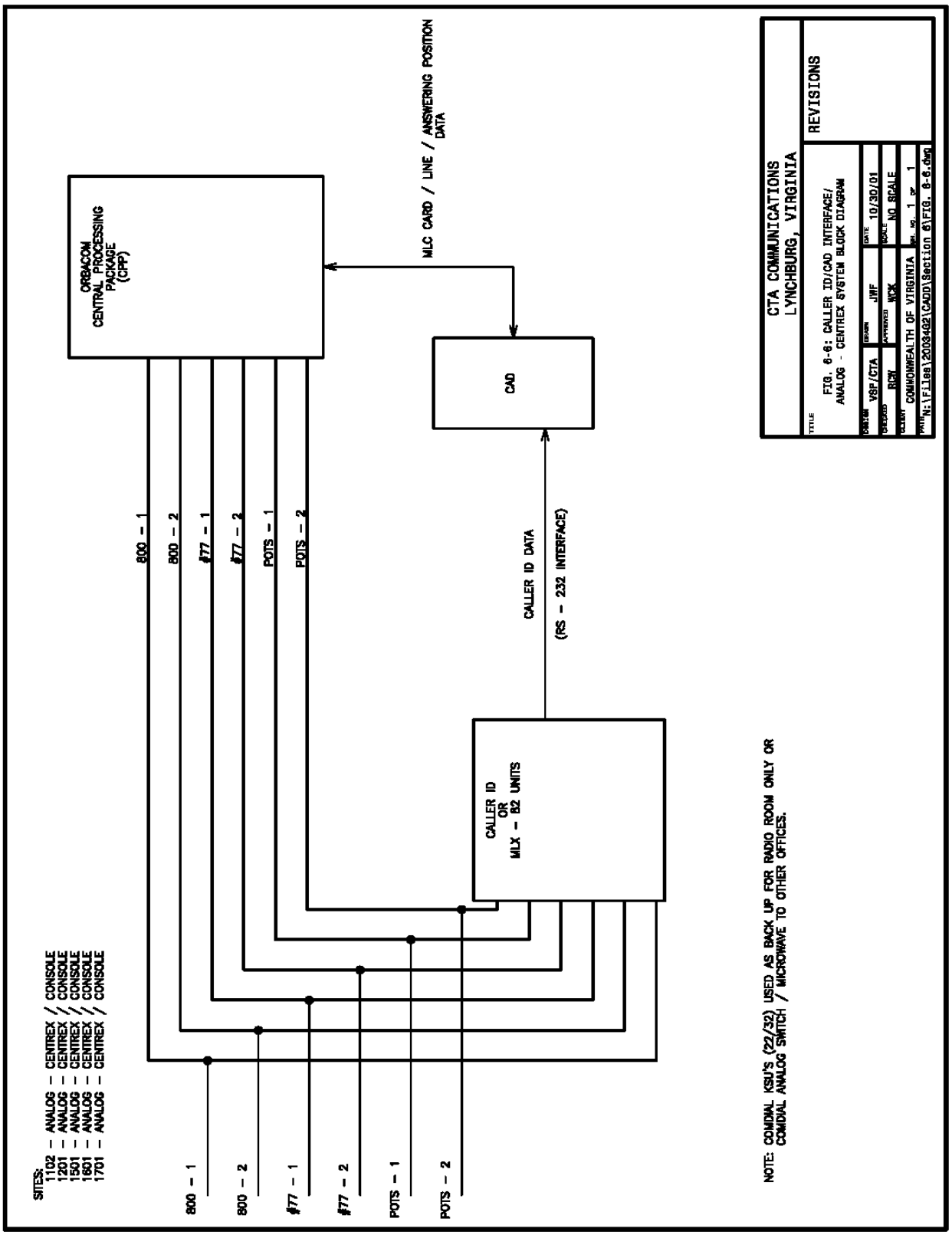
TABLE 6-1
COMMUNICATION ZONES

EXISTING VSP DIVISIONS	COMMUNICATIONS ZONE NUMBER
D1 SOUTH	CZ-01
D1 NORTH	CZ-02
D2 EAST	CZ-03
D2 WEST	CZ-04
D3 SOUTH	CZ-05
D3 NORTH	CZ-06
D4 EAST	CZ-07
D4 WEST	CZ-08
D5 NORTH	CZ-09
D5 SOUTH	CZ-10
D6 SOUTH	CZ-11
D6 NORTH	CZ-12
D7	CZ-13

Table 6-4 Commonwealth of Virginia Owned / Operation Aircraft			
Manufacturer	Model	Registration	Based
DEPARTMENT OF AVIATION			
Cessna	CE550	N1VA	Richmond
Beechcraft	BE200	N7VA	Richmond
Gulfstream	695B	N2VA	Richmond
Cessna	206G	N5VA	Richmond
VIRGINIA MARINE RESOURCES COMMISSION			
Cessna	Wierwood	182P	Accomack Co.
DEPARTMENT OF GAME AND INLAND FISERIES			
Cessna	172E	N76CG	Weyers Cave
Piper	PA18	N64674	Chesterfield
VIRGINIA STATE POLICE			
American Eurocopter	BO105LS	N38VA	Chesterfield
American Eurocopter	BO105LS	N39VA	Abingdon
Bell Helicopter	407	N30VA	Manassas
Bell Helicopter	407	N31VA	Lynchburg
Bell Helicopter	407	N34VA	Abingdon
Bell Helicopter	407	N36VA	Chesterfield
Cessna	182	N33VA	Abingdon
Cessna	182	N32VA	Manassas
Cessna	182	N35VA	Lynchburg
Cessna	182	N29VA	Chesterfield
MILITARY AFFAIRS			
Sikorsky	UH-60 Black Hawk		Richmond
Sikorsky	UH-60 Black Hawk		Richmond
Sikorsky	UH-60 Black Hawk		Richmond
Sikorsky	UH-60 Black Hawk		Richmond
Sikorsky	UH-60 Black Hawk		Richmond
DEPARTMENT OF FORESTRY			
Cessna	310	N48VF	Weyers Cave
Cessna	182	N2097X	Louisa Co.

Table 6-4 Commonwealth of Virginia Owned / Operation Aircraft			
UNIVERSITY OF VIRGINIA			
Bell	430	N4UV	Charlottesville
Beechcraft	BE90	N300VA	Charlottesville
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY			
Cessna	172	N61891	Blacksburg
Cessna	152	N95103	Blacksburg
Cessna	152	N94218	Blacksburg


CTA COMMUNICATIONS
LYNCHBURG, VIRGINIA
REVISIONS
TITLE
FIG. 6-5: CALLER ID/ TELEPHONE SWITCH INTERFACE BLOCK DIAGRAM
DESIGN VSP/CTA
DRAWN JWF
DATE 10/30/01
CHECKED RCH
APPROVED WCK
SCALE NO SCALE
CLIENT COMMONWEALTH OF VIRGINIA
SHT. NO. 1 OF 1
PATH N:\File1\2003402\CADD\Section 6\FIG. 6-5.dwg
ORBACOM CENTRAL PROCESSING PACKAGE (CPP)
MLC CARD/ LINE / ANSWERING POSITION DATA
CAD
800 - 1
800 - 2
#77 - 1
#77 - 2
POTS - 1
POTS - 2
CALLER ID DATA
(RS - 232 INTERFACE)
TELEPHONE SWITCH
CALLER ID OR MLX - 82 UNITS
SITES:
1301-NEAX
1401-1SBX (TADIRAN)
800 - 1
800 - 2
#77 - 1
#77 - 2
POTS - 1
POTS - 2


ORBACOM
CENTRAL PROCESSING
PACKAGE
(CPP)
MLC CARD / LINE / ANSWERING POSITION
DATA
CAD
CALLER ID DATA
(RS - 232 INTERFACE)
CALLER ID
OR
MLX - B2 UNITS
800 - 1
800 - 2
#77 - 1
#77 - 2
POTS - 1
POTS - 2
SITES:
1102 - ANALOG - CENTREX / CONSOLE
1201 - ANALOG - CENTREX / CONSOLE
1501 - ANALOG - CENTREX / CONSOLE
1601 - ANALOG - CENTREX / CONSOLE
1701 - ANALOG - CENTREX / CONSOLE
NOTE: COMDIAL KSU'S (22/32) USED AS BACK UP FOR RADIO ROOM ONLY OR
COMDIAL ANALOG SWITCH / MICROWAVE TO OTHER OFFICES.
CTA COMMUNICATIONS
LYNCHBURG, VIRGINIA
REVISIONS
TITLE
FIG. 6-6: CALLER ID/CAD INTERFACE/
ANALOG - CENTREX SYSTEM BLOCK DIAGRAM
DRAWN V&P/CTA
DESIGNED RCM
APPROVED WCK
DATE 10/30/01
SCALE NO SCALE
CLIENT COMMONWEALTH OF VIRGINIA
SH. NO. 1 OF 1
PATH N:\Files\20034G2\CADD\Section 6\FIG. 6-6.dwg

This upgrade is envisioned to include the addition of digital microwave equipment to the existing digital microwave system, the overbuild of the analog microwave system where appropriate, and the addition of additional digital links where none exist to support the STARS communications network. It is highly desirable that the SI continues the use of the 2 GHz microwave links where appropriate. The telecommunications microwave radio upgrade will be phased into the existing network, and integrated into the existing network with no unplanned disruption to existing radio, telephone or data operations. It is therefore intended that the microwave radio upgrade conform to the wideband specifications contained in this document.

It is envisioned that the minimum initial circuit requirements include the number of circuits to support the functional system design documentation listed in Figure 7-1, and Table 7-1 located at the back of this section. ~~The circuits with a link application of "expansion" are to be designed into the network but not implemented in this phase of the project unless necessary.~~ **The term "overlay" used herein indicates the addition of new microwave equipment to existing sites to provide increased circuit capacity (i.e., an increase of circuit capacity from the DS-3 level to the OC-3 level) and/or to provide minimum one-way microwave path availability as specified in Section 7.12 B of the specifications. Figure 7-1, Revision 2, dated 10-29-01 shows all microwave sites, both new and existing, of the STARS system and indicates proposed upgrades. The microwave functional design has four separate categories defining the Link Applications are given below, and defined again in Table 7-1**

A = This category is an overlay application, or digital upgrade of existing microwave links to support increased circuit capacity requirements. The term "overlay" used herein indicates the addition of new digital microwave equipment to existing sites to provide increased circuit capacity (i.e., an increase of circuit capacity from the DS-3 level to the OC-3 level) and/or provide a digital upgrade of existing 900 MHz and 2 GHz radio links.

B = This category is an application that provides connectivity of Virginia State Police Area Offices into the microwave network.

C = This is an application that is utilized to maintain path reliability (see Section 7.12 B) and/or provide alternate routing (i.e., a ring configuration). Space Diversity shall be employed if the one-way path availability cannot be achieved using a non-diversity configuration. Alternate links are acceptable if they meet the intent of this functional design goal.

D = This category indicated the links that provide Intranet connectivity into the microwave network that ARE required during the initial implementation (Phases I-IV).

E = This category indicates the links that provide Intranet connectivity into the microwave network that ARE NOT required during the initial implementation (Phases I-IV).

~~For instance, if~~**Future expansion should be planned into the initial design. For example,** a new tower ~~is being designed, the~~**should be built with the structural capacity to support** antennas and cables necessary for the future expansion **of the Intranet** ~~should be accounted for in the structure if the tower, but not installed~~. MW radios should be capable of expansion to allow for the additional traffic when the additional circuits are implemented. The upgraded microwave network will replace all of the VSP Data Processing leased lines, including the VSP Area Offices used for the VSP Wide Area Networks (WAN) and Local Area Networks (LAN).

COV is planning to have Primary and Backup Network Control Centers located at the SPHQ facility. These Centers will provide network monitoring and control for the LMR, MW, mobile data, alarms, and Intranet of the STARS network and will require fiber optics or microwave connectivity to the SPHQ tower site. Figure 7-2 at the end of this section provides a functional overview of the fiber optics design.

It is anticipated that the system expansion has the capability to expand to accommodate future growth requirements with the addition of units into the initially provided equipment shelf or shelves. It is expected that the proposal include a plan with sufficient design details to assure that the microwave radio system can effectively and economically be installed and expanded to support system communications needs. It is the intent of these specifications that the digital microwave communications system be designed to provide system-wide path reliability as specified herein. The SI shall provide, in their proposal, firm path reliability guarantees to the COV.

G. Reliability/availability prediction.

H. Overall system design, including all interfaces.

I. Defining and coordinating use of COV facilities, and providing or making arrangements for all other facilities required.

J. Furnishing of all equipment.

K. Installation and construction.

L. Alignment, tests, and final commissioning.

M. Operational and maintenance documentation, equipment, and training support (Scenario 2) as described in Sections 4 and 5.

N. Plan all system accommodations to support the future communications growth plan of the participating agencies, as described in the document. The COV will not approve replacement of a tower due to inadequate planning on the part of the SI.

The SI ~~is expected to~~**shall** provide the following documentation to the COV Project Manager and the Engineer according to the project schedule listed in of Section 4:

A. Support documentation for FCC licenses including frequency recommendations with search documentation and FCC Form 601 Schedule I.

B. ~~Support~~**Completed** documentation for FAA notice of proposed Construction or Alteration 7460-1.

It is expected that the microwave system will utilize the North American digital signaling technology as shown in Table 7-2, and Table 7-3 at the end of this section.

0.6 F_1 + 10 feet at K = 1.0
0.3 F_1 at K= 2/3
1.0 F_1 at K= 4/3

- A Severely Errored Second state (SES, defined as BER of 10^{-3}) objective of less than 6.4 X D one-way SES/mi/year (Where D = Path Length in Miles) for any one link.

C. General Performance

The Microwave Infrastructure must be adequate to support the telecommunications requirements, as defined in the Specifications for initial and future capacity without the replacement of major radio, multiplex, or channel bank equipment.

Master synchronization clock and network distribution is required to phase lock all DS-1 channel banks so that relative audio phase variation will not exceed plus or minus 2 degrees.

7.13 System Test Performance For Digital Microwave

The radio equipment described herein is expected to function individually and as a complete system. As such, the thrust of the performance specification and of subsequent acceptance criteria will be on system performance

The equipment shall have been turned on, aligned and operational prior to beginning the acceptance test. Tests are to be conducted in such a way as to be repeatable. For acceptance purposes, it is expected that the tests be documented by the SI, and that they be witnessed all or in part by the COV Project Manager and the Engineer.

The SI ~~is expected to~~**shall** issue a test report, in draft form, for approval by the COV Project Manager and the Engineer at the completion of the thirty (30) day performance test. The SI ~~is expected to~~**shall** submit the final report within two weeks after the recommendation of cutover by the COV Project Manager and the Engineer.

7.13.5 Microwave System End-to-End Verification

A. End-to-end BER test on primary (A-side) Transmitter/ Receiver unit (A1 radio) for a 24-hour period for each link in the system. BER not to exceed the test objective of $Nx10^{-10}$ one-way, where N = the number of links of microwave.

B. Switch to secondary or protection unit where applicable. End-to-end BER test on secondary radios for 4 hours. Test requirements will be finalized based on design configuration.

C. Documentation of Mean Time Between Failure (MTBF) Calculations for worst-case routes.

D. End-to-end orderwire and remote alarm/control tests.

7.13.6 2 GHz/ 950 MHz Analog Radio Test

During the system upgrade the SI shall maintain system operations. The microwave equipment performance functions for analog microwave links shall be fully tested by the SI and test documentation provided to the COV Project Manager and the Engineer for review and approval. The SI ~~is expected to~~**shall** record and submit the following test data for reconfigured or transferred analog microwave links:

Transmitter

A. Frequency
B. Power
C. Deviation

Receiver

A. Frequency
B. Sensitivity
C. AGC Calibration

Transmission Tests

A. Test Tone Level
B. BB Frequency Response
C. Spurious Tone Search
D. Idle Noise - Noise Loading
E. IMD - Noise Loading
F. Pilots
G. Alarms/Protection Switching

System Documentation

A. FCC/ FAA documentation
B. Interface wiring diagrams
C. Baseband Treatment (Filters, Amps, Bridges, etc.)
D. Multiplex Channel Allocations

7.14 Cutover Plan

It is expected that the conversion from the existing analog and digital microwave system to the upgraded digital microwave system be accomplished such that there is no disruption to public safety operations in process during the cutover. ~~It is recommended that t~~**T**he Offeror **shall** provide a general plan for **microwave** cutover with the proposal, and a detailed **microwave** cutover plan to the COV Project Manager and the Engineer ~~as defined in Section 4.~~**. These plans shall be in conformance with the schedule requirement of Section 4.19.**

This plan is expected to take into account fixed equipment cutover, any dual operation necessary, and personnel schedules. The Offerors shall include estimated anticipated costs associated with cutover, and necessary to be born by the COV, in the proposal.

Maintaining the performance of the existing analog microwave system and using these links as they exist or re-configuring and re-routing links to establish necessary communications during the upgrade of the system.

7.14.2 Microwave radio path upgrade

Where the Offeror has identified digital microwave paths that require a capacity overbuild, the Offeror is expected to describe the method used to replace the digital microwave path. COV requests that the Offeror describe fully in their Proposal the methodology used to overbuild the identified paths. The paralleling of existing microwave paths, replacement of the multiplexer units, or the building of alternative paths to support the STARS channel plan is acceptable, providing there is no service outage-time impacting operations of the system. Figure 7-4 at the back of this section provides an example of an overbuild of an existing 2 GHz analog path with a digital microwave path operating in another frequency band. The COV expects that this paralleling technique, or a similar technique, will be utilized wherever possible to minimize impact on the system. Care should be taken to maintain operations of the existing circuits, orderwire and alarm system operations.

During cutover, it is acceptable to install and test non-protected radios that will eventually attain redundancy through the completion of a loop or ring network, providing there is an alarm and status-reporting network in place. It is encouraged, wherever possible, to parallel with the existing 2 GHz analog radios links to maintain redundancy and protection against path or equipment failure.

The SI may upgrade or relocate 2 GHz links as long as the COV frequencies remain eligible for the MSS relocation.

7.14.3 Scheduled Cutover Time

Once the upgraded microwave radio system is tested and accepted for cutover by the COV Project Manager and the Engineer, the SI ~~is expected to~~**shall** coordinate with the COV Project Manager and the Engineer, to transfer traffic and alarm and control status points from the existing system to the upgraded system. This work should be conducted during times of low traffic activity so as not to jeopardize operations. The COV desires that the SI submit a planned cutover request form to the COV Project Manager and the Engineer before the planned activity. Requested information should include:

- Div 3 ISDN leased service
- Div 4 Tadiran Switch
- Div 5 ISDN leased service
- Div 6 NEC NEAX Switch
- Div 7 ISDN leased service

All equipment to be interfaced with the public telephone system should conform to the requirements of the public telephone companies with respect to audio levels and control voltages. The SI is expected to provide all interface equipments. The SI is to supply the COV Project Manager and the Engineer with a list of, and specifications for, all required external circuits within 90 days after contract execution. It is expected that the COV will arrange for, these circuits with the assistance of the SI. It is expected to be the SI's responsibility to coordinate the installation of all leased telephone circuits.

In the event that dedicated telephone lines are required as part of this system, for example, in the implementation of the satellite receiver portion, it is expected that the Offeror include both recurring and non-recurring costs of those lines in the proposal as part of the base price. Recurring costs should be based on the present cost of the service per year times five (5) years.

The SI ~~is expected to~~**shall** coordinate with the COV Project Manager and the Engineer to cutover the microwave telephone circuits currently on the system and assist the COV in providing connectivity of new telephone circuits to be added to the system. The microwave system upgrade is expected to immediately support the existing telephone circuitry of the State Police as it currently exists, the new area offices being added to the MW network, and future microwave telephone capability for the new communications sites when they are phased in as delineated in the implementation schedule. The SI shall provide a microwave telephone at each transmitter (both LMR and microwave) site and console position (both dispatch and network control), adjacent to the equipment for a technician's use. Future expansion may support the telephone circuitry of other state agencies.

The proposed telecommunications system upgrade should provide the highest reliability for emergency telephone service and allow the Commonwealth opportunities for significant savings in telephone charges. Recurring leased line charges in many cases can be reduced or eliminated by providing equivalent facilities within the microwave network.

The light wave multiplexers are expected to include with pigtail jumpers with appropriate factory-installed and tested FC and or ST connectors to interface with the fiber optics cross-connect panels.

7.18.5 Proof of Performance

It is desired that the SI conduct an end-to-end Attenuation Test to verify that the loss values do not exceed the manufactures recommended attenuation allowances.

The SI is expected to measure the attenuation of each cable segment from patch-panel to patch-panel and provide the results to the COV and Engineer for Test Acceptance approval.

7.19 Microwave Antenna System

The microwave antenna system is expected to be an Andrew product or a COV approved equivalent and be compatible with the radio frequency bands and conform to applicable FCC requirements. They are expected to be of the solid parabolic type with radomes to minimize tower wind loading**. It is desired that heated radomes be used in areas subject to icing, such as mountaintops.**

High-performance category "A" antennae with low VSWR are to be used as required by the FCC to meet the total system end-to-end performance requirements. Category "B" antennas are acceptable as long as the end-to-end performance requirements are met.

High–performance category “A” antennas are normally supplied with flexible planar radomes. Category “B” antennas are to be supplied with molded radomes for protection against ice and snow accumulation. Ice shields are to be provided for any new antenna installation for protection against falling ice.

Antennas 6 ft or greater in diameter, or any antennas installed on towers located in high-wind areas are to be braced with a second side-strut. Microwave antennas are not be installed in the vicinity of other communications antennas if the installations contribute to performance degradation or “shadowing” of the LMR antennas.

It is envisioned that the partnerships will enhance the performance of the STARS radio system, offset site development and maintenance costs, and provide an efficient collocation program that will minimize the need for tower sites, and maximizing the use of the required tower sites.

It is desired that the Offeror address the future growth potential telecommunications requirements of collocated wireless providers, as well as the COV'S growth plans when planning a microwave tower communications site.

The COV urges that a development plan be established that will facilitate partnerships with other local government entities and/ or the private sector businesses to integrate the telecommunications requirements of all potential wireless providers onto an overall Comprehensive Plan.

The Plan should facilitate cooperation and participation of Wireless providers to allow the STARS telecommunications infrastructures support available and emerging technologies.

It is urged that the Offeror include a yearly revenue estimate that can be realized by the COV for the collocation of a wireless provider's antenna platform at typical STARS tower site. The yearly revenue estimate should be delineated in the Price Forms provided in Section 13.

7.23 Upgrade and Enhancements to the Microwave Network

Upgrades and enhancements to the existing VSP microwave backbone are ongoing, in an effort to improve the reliability while reducing costs.

Recent upgrades to the microwave system include extension of DS3 connectivity from the previous terminal location of Poor Mountain to Salem Headquarters via Fort Lewis Mountain. Digital circuits now provide service to Headquarters telephones (12), site telephone and Radio control circuits to Fort Lewis Mountain (4), and radio control circuits (6) between Poor Mountain and Salem Headquarters. As part of the Salem Digital Upgrade, extensive renovations were performed to the interior of the Fort Lewis Mountain Building. Air-conditioning, improved (chemical) grounding, an ice bridge, and ladder rack have been installed.

Land mobile radio and microwave equipment has been relocated from the original White Oak Mountain Site (Blue Ridge Broadcasting) to a new site on the same mountain. Relocation of three microwave radios, three VHF stations (one VDOT),

and the addition of one site telephone circuit were accomplished. The basic equipment configuration and capabilities remain the same.

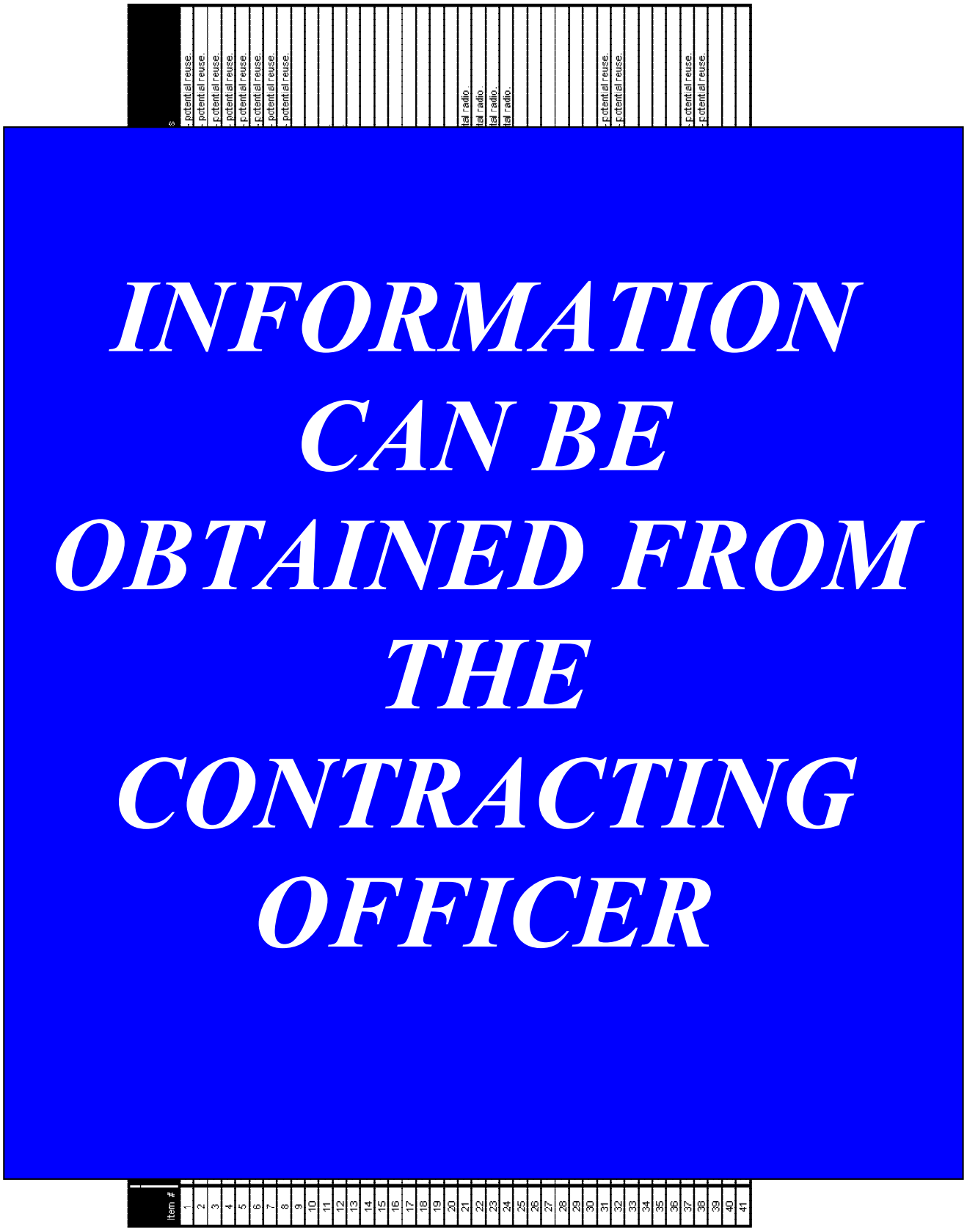
Microwave equipment has been delivered for extension of the digital microwave system from its present terminal location at View Tree (Warrenton Training Center) to Seventh Division Headquarters in Fairfax. DS3 service will be provided. Installation and optimization of this equipment is scheduled for July, with final completion and cutover expected in August 2001. As part of that upgrade, telecommunications circuits for area offices and repeater sites that were routed through the Warrenton Repeater will be rerouted through the digital system.

Equipment buildings have also been procured and set for Pinnacle Ridge in Frederick County and the Melfa Area Office in Accomack County. The Pinnacle Ridge building replaces an aging fiberglass. The Melfa Building was procured to improve equipment configuration, and to allow relocation prior to planned renovations of the Area Office Building. Both buildings are similarly constructed 12' X 24' prefabricated concrete structures with an auxiliary generator room.

A new tower is being erected at the Sounding Knob Site in Highland County. The primary purpose of the new tower is to accommodate VDEM IFLOWS equipment, but the existing microwave antenna will be relocated (from a pole mount) to the new tower.

Completion of a digital microwave path to the Eastern Shore of Virginia is also planned for January 1, 2002. The new path will extend digital connectivity (4 – DS1) from the current Williamsburg repeater site via a new site in Mathews County. Contracts are in place to provide the space diversity equipment across the bay. A contract to provide connection to the existing Williamsburg site has received preliminary approval.

Planning is underway for the extension of the digital microwave network from Poor Mountain to Wytheville Headquarters via Walker Mountain. The new route is expected to require two to three hops.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49	9105-9301	
50	9105-9301	
51	1201-1204	
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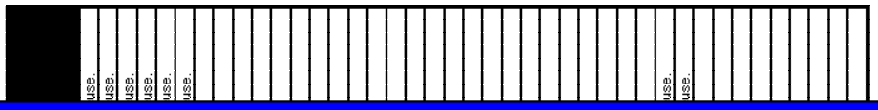

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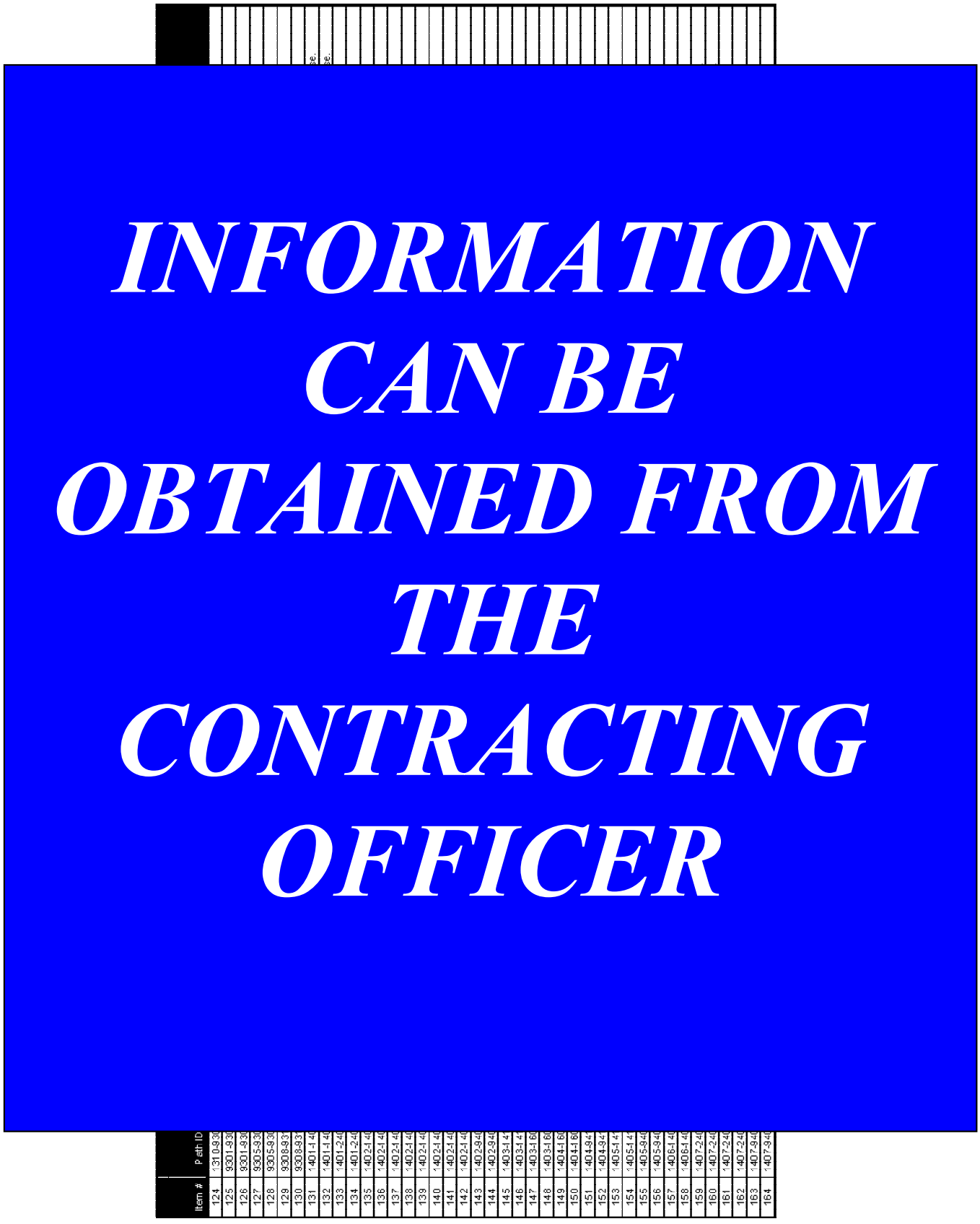

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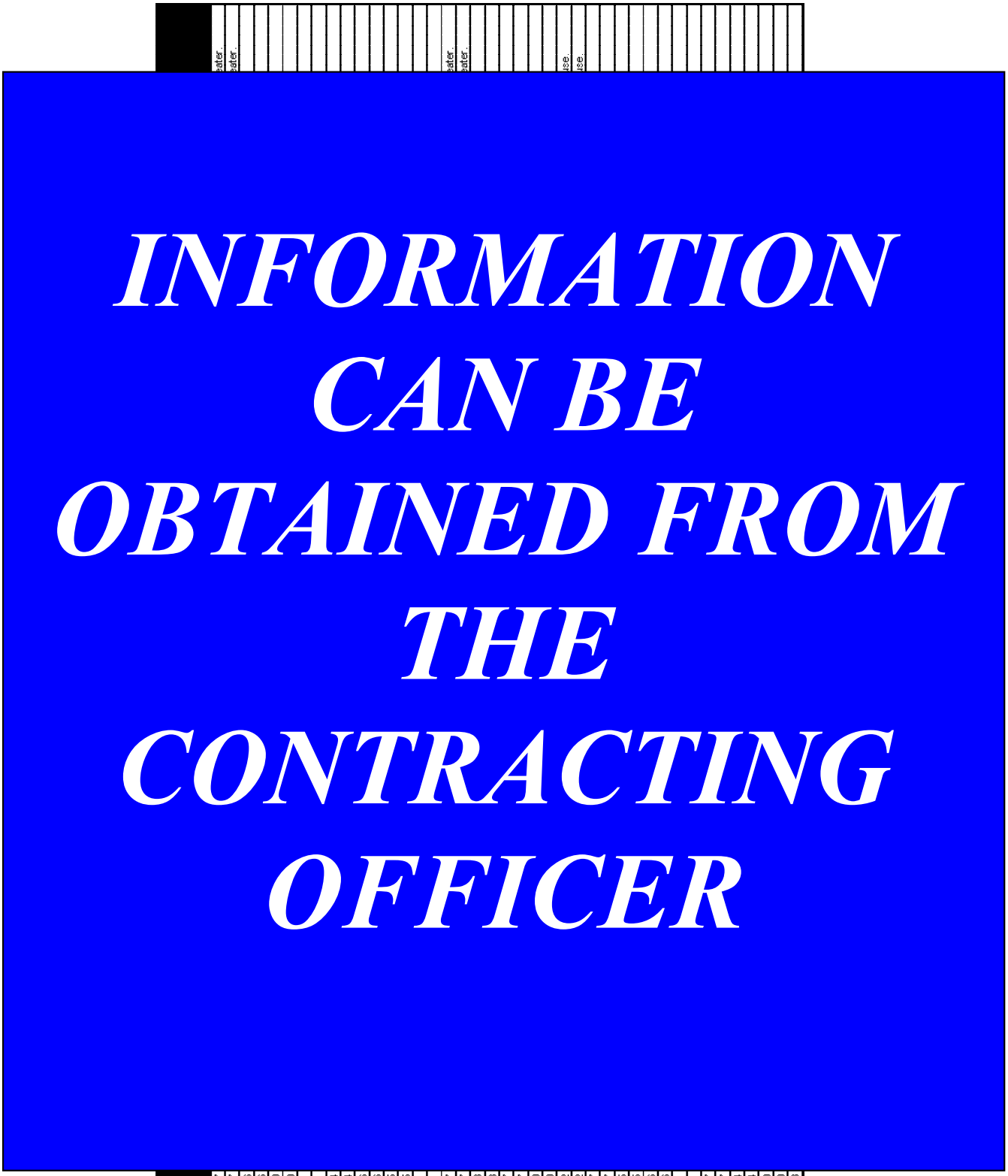

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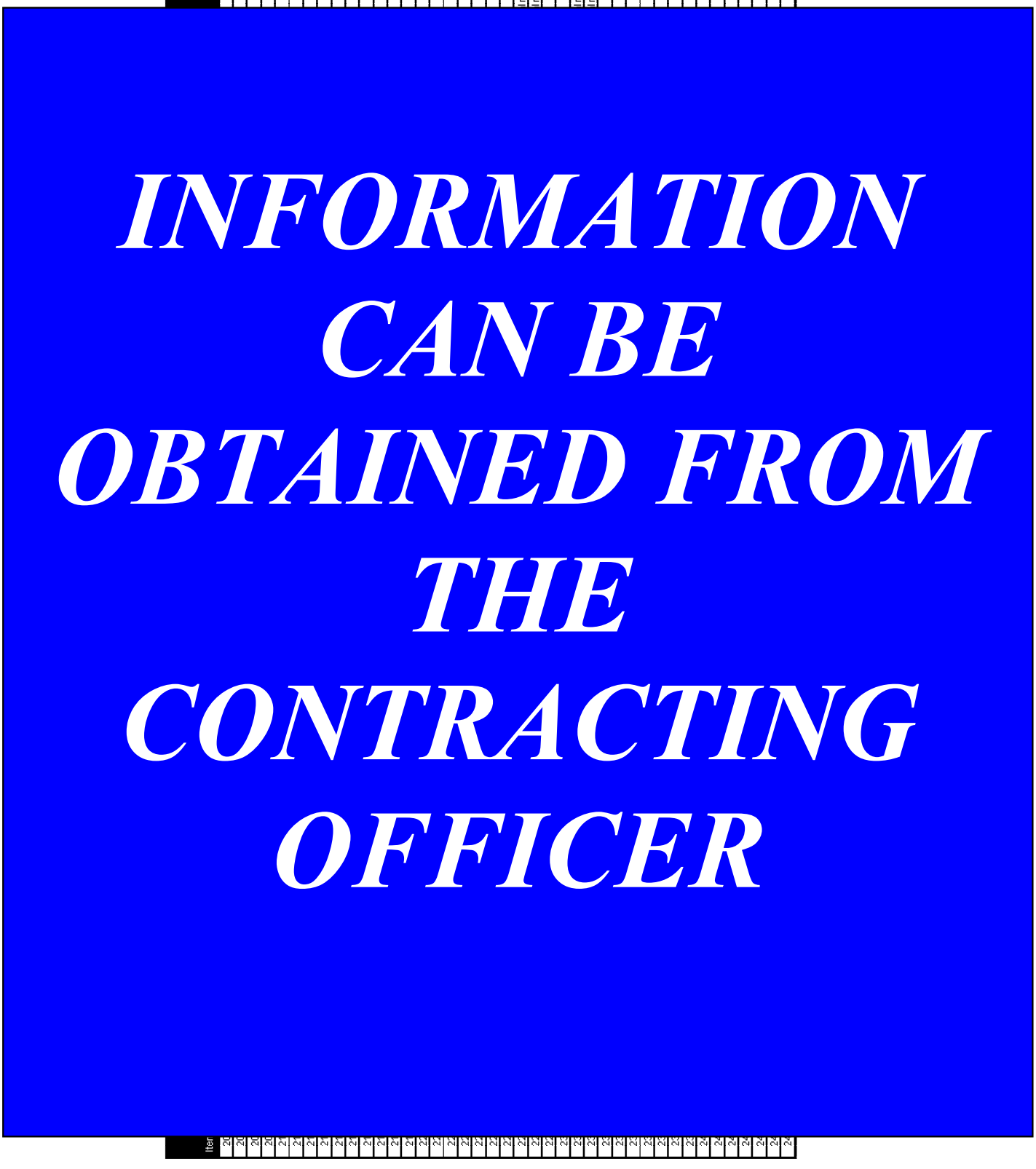
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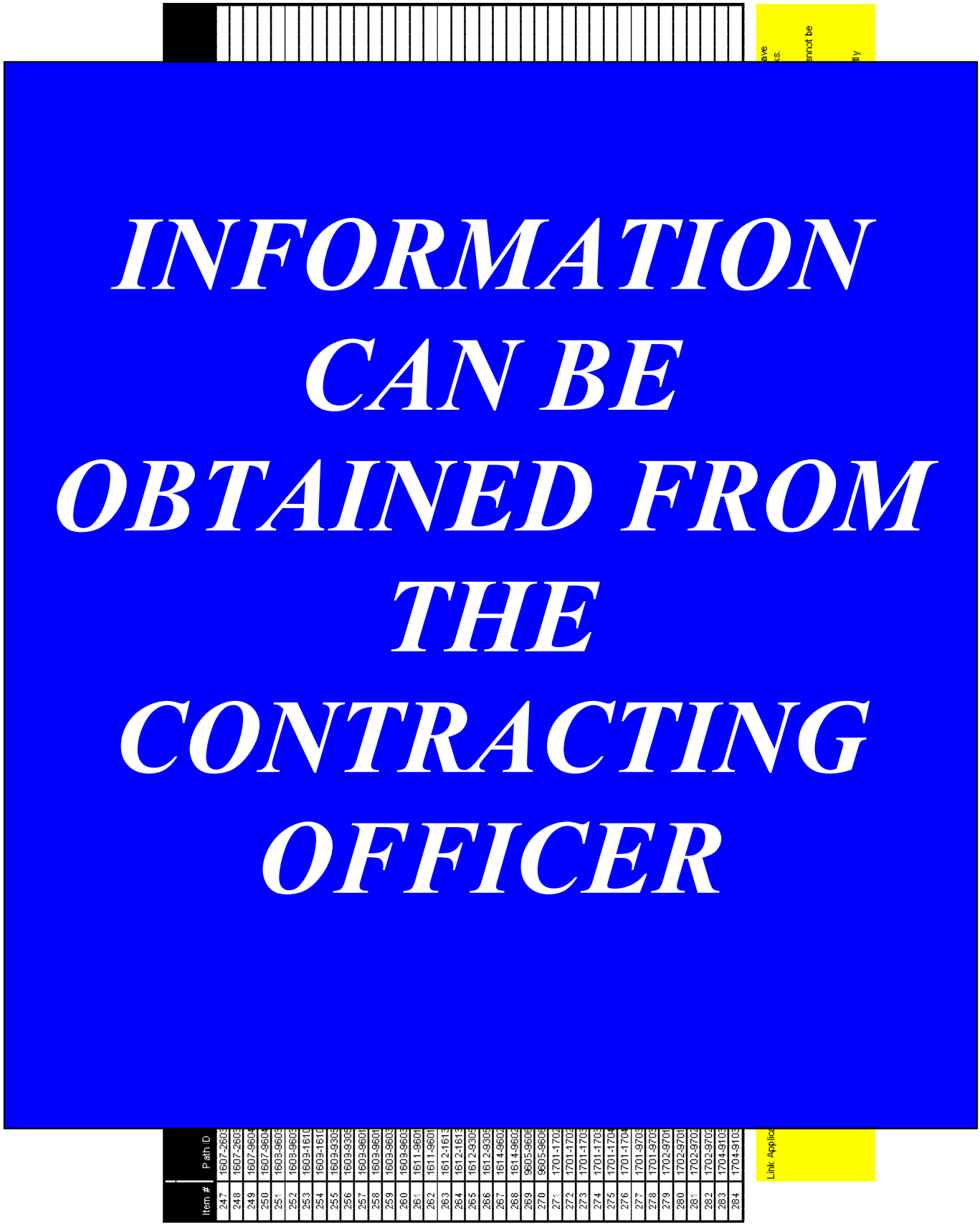
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8.2 Frequencies

The mobile computer terminal (MCT) shall transmit data to and from vehicles over a two-way radio channel. VHF frequencies may be available for mobile data, however, the use of frequencies in the 450 MHz or 800 MHz bands are viable alternatives. Where alternative frequencies are proposed, the licensing of these frequencies shall be included as a part of this proposal.

Data transmissions may be handled by the radio system either trunking (circuit switched), packet switched or a combination of these modes.

The offeror may propose a second data-only radio separate from the voice radio. COV will evaluate this proposal on a cost, configuration, performance, coverage, and functional basis.

8.3 Integration of Existing Mobile Computer(s)

COV currently has mobile (laptop) computers that shall be integrated into the system. Refer to Table 8-1 thru 8-3 for the configuration data on these units. These units include:

- Virginia State Police (VSP) - five hundred (500) units in procurement. Operate on the Cellular Digital Packet Data (CDPD) and CS-CDPD networks in Virginia.

- Department of Mines, Minerals, and Energy (DMME) - eighty (80) units in use. These DMME units are configured to operate with dial-up network access and currently do not have wireless capabilities.

- Department of Environmental Quality (DEQ) – twelve (12) units in use. These DEQ units are configured to operate with dial-up network access and currently do not have wireless capabilities.

Should it be economically and practically feasible, it is the desire of COV to use these legacy computers until their functional end of life. It is desired that the Systems Integrator (SI) facilitate the use of these legacy machines on the upgraded wireless data communication network for the remainder of their useful life. Elements to be considered are:

- Additional capacity in the existing computers including memory and hard drive requirements,
- Equipment to be added to or removed from the**se ~~existing~~** unit(s), **including existing wireless modems in VSP vehicles (current wireless data services will be terminated by the COV upon migration),**
- Software changes, required and/or recommended,
- Ability of the modified computers to support the system encryption requirements,

System, Federal Offender File, Sexual Offender Registry, Deported Felon File, Foreign Fugitive File, US Secret Service Protective File, Violent Gang and Terrorist Organization File, and the National Protective Order File.

- National Law Enforcement Telecommunications System (NLETS) – Phoenix, Arizona including but not limited to, National Criminal Justice Agencies, FAA Registration and Tracking Files, Canadian Files, Out-of-State Automated Department of Motor Vehicle Files.

- Additional capabilities:
  - Access computer aided dispatch (CAD) data files including calls pending, calls in progress, calls completed, event files, and nearby or proximate events. The VSP Computer Aided Dispatch system is described in Appendix L of this specification.
  - Connect to the VSP-LAN. This includes sending and receiving messages (with attachments) from the VSP-LAN user community. (This will be available for authorized VSP employees).
  - Interface with the Capitol Wireless Integrated Network (CAPWIN). Refer to Figure 6-2 for a diagram of the CAPWIN network.
  - Accept free-form VCIN commands.
  - ~~Transmit data and~~**Support** message communications **and data communications with** ~~between~~ dispatcher**s**, ~~from a~~ network console **operators**, and **other mobile terminals** ~~vehicle and from vehicle to vehicle~~.

8.4.2 Future Functionality

The Commonwealth desires a system scaleable to achieve the additional functionality below. The Commonwealth recognizes that this specific functionality may change or may not be achievable under the present bandwidth limitations of mobile data. The items below are intended as a guide to future performance and design. Offerors are instructed not to respond the any of the specific items listed below but should supply a general description as to how their proposal will be scaleable to future needs.

- Transmit Geographical Information System (GIS) information
- Receive and view photographic files and digital photographs

- Obtain and transmit data under NCIC 2000. The COV desires that the system be designed to be capable of meeting NCIC Service Level 4 with the understanding that current wireless technology and bandwidth may limit to service level 2.
- Allow access to fire preplans and hazardous material (HAZMAT) plans.
- Maintain specialized forms and data for individual participating agencies as shown in Table 8-4. The agency data requirements listed in this table (with the exception of VCIN and its connections) describe how the COV expects mobile data and the Intranet to mature in future phases of this project. It is the expectation of the COV that the proposed networks have the expandability to facilitate these future requirements.
- Receive and implement software revisions and updates without significant operator involvement or interruption
- Support over-the-air rekeying (OTAR) for distribution of cryptographic keys
- Transmit non-public safety data files
- Support report filing from the vehicles
- Interact with scheduling programs such as Microsoft Outlook for individual scheduling

The SI shall be responsible for providing all equipment required for a fully operational turnkey system. That responsibility includes all hardware, software, processors, interfaces, installation, testing, support, engineering, and design.

8.5 Conceptual System Layout

The conceptual drawing (Figure 8-1, attached) is provided as guidance to the physical equipment in the mobile data network. Other designs are encouraged and will be considered where they offer an equivalent level of **functionality and** performance at a lower cost or offer significant performance enhancements.

The SI is expected to define the methodology for determining which files are routed via commercial wireless data services. Where possible, the parameters used for this decision should be able to be adjusted by the system administrator. The system administrator should also have the ability to discontinue commercial wireless data services service for all units or any individual unit.

This switch may be hardware, software, or a combination of the two. The Offeror shall provide a complete description of switch operation, and the expected effects of adjustments in the parameters used to select commercial wireless data services. The switch should operate without user input.

The Offeror shall define the number of retries allowed under commercial wireless data services before the system shifts to STARS.

8.7 Vehicular Mobile Computer Terminal

8.7.1 Function

The mobile computer terminal functions as the mobile operator's link to the mobile data system. The mobile computer terminal shall transmit data requests and information through a radio data interface to the mobile radio in the vehicle. The radio data interface can be included as part of the radio unit. The mobile radio shall then transmit the data over the trunked RF system to the base station receiver for further routing.

8.7.2 Configuration Management

New mobile computers **procured by the SI** shall consist of the ~~same~~ **equal or enhanced functionality and performance of the previous** computer model, central processing unit (CPU), expansion cards, hard drives, memory, display, switches, external devices and software. **However, all variations shall be documented and approved by the COV Project Manager before they of purchased.** Software and/or hardware controls shall be employed to limit the ability of any individual user to change the system configuration including limiting the ability to add executable files. The software shall limit access to VCIN to only COV Project Manager authorized sworn personnel.

8.7.6 Electrical Characteristics

System components (hardware and software) are expected to be selected from those commercially available. The COV desires a minimum of special or modified components. The Offeror is expected to identify any special or modified components in their proposal.

The operation or use of the MCT or any attachments in the vehicle shall not cause interference to any other electronics within the vehicle including radios, video equipment or other vehicle electronics.

A. Operating Voltage

The mobile computer terminal and any other vehicle located equipment shall operate from a standard automobile power source with a range of 10 Volts DC to 16 Volts DC. The terminal and associated equipment shall tolerate the vagaries of automotive power supplies without damage to the terminal, **or**~~the~~ vehicle**,** or loss of data. The MCT and **communications devices**~~data radio if~~ used~~,~~ **for data transmission** shall not drain the vehicle battery to the point were the vehicle is unable to start.

B. Backup Power

An internal backup power system shall be located within the mobile computer terminal. The backup power system protects the integrity of stored data any time the mobile computer terminal is disconnected from the main power source. The mobile computer terminal shall also be protected from voltage transients incurred while starting the vehicles motor or operating any vehicle accessories. While the unit is operating on battery power, and indication shall be continuously on to alert the user that battery power is in use. When the battery power remaining is less than 5 minutes, the MCT should automatically shutdown without any data loss.

The MCT should also be provided with an adapter that will permit the unit to be operated and recharged from standard household voltage and current.

Batteries provided shall not exhibit memory effects nor require complete discharge to regain their full capability.

B. Message Pending Indicator

The mobile computer terminal should indicate that a message has been received with a flashing visual indication and an audible signal. The audible signal may vary depending on the type of message received. The audible signal volume shall be controlled by a volume control located on the mobile computer terminal. This volume control is designed so that it cannot be completely turned off.

8.7.9 Keyboard/**Pointing Device**

The keyboard shall be fully PC compatible and have a QWERTY key arrangement. The keys should be full travel with tactile feedback. It is desired that the keyboard be removable and swivel (using the mount), and easily usable by either the driver or the passenger. It is desired that an adjustable intensity light illuminate the keyboard and controls. The terminal shall not be equipped with an emergency status key (or software function)**.**

A pointing device shall also be provided. This device shall be integral to the MCT. Trackballs, touch pads, or other devices may be used.

8.7.10 Function/Status Keys

Twelve (12) programmable function/status keys should be included as part of the keyboard or located on an auxiliary keyboard. These keys are capable of performing programmatic functions within software as well as transmitting status reports. An on screen menu shall display function and status key designations.

8.7.11 Processor and Memory

The computer should have **at least** an Intel® Pentium® III processor or **COV approved** equivalent running with a clock speed at or above 500 MHz. The mobile computer terminal shall be capable of receiving and storing text graphic type information commonly used in GIS type applications. The mobile computer terminal should have the following minimum requirements to effectively support the advanced graphical and reporting requirements:

- 128Mb of Random Access Memory (RAM)

- 20Gb of hard disk drive (HDD) space
- Universal Serial Bus (USB) port

8.7.12 Installed Software

The MCT will have fully functional licensed copies of all software necessary to comply with these specifications. Further, the MCT l be pre loaded with the following latest version of Microsoft Office programs

- Word
- Excel
- Messaging client – The COV is concerned that Microsoft Outlook is not capable of serving in both a public safety and a bandwidth limited environment. Accordingly, the Offeror shall propose a second messaging client where Microsoft Outlook is used for other message needs. However, at no time shall any MCT contain more than a single message client.

For each of the above programs, it is expected that the SI **shall** provide a licensed CD-ROM for each installed program to the COV Project Manager. Where desirable, the SI may provide CD-ROM's for 10% of the delivered units and license documentation for the remainder. The CD-ROM for each operating system should also be provided to the COV Project Manager.

Software shall also be provided to assist in compiling data to identify racial profiling. This may be a specialized client or work through the CAD interface. The Offeror shall identify the software intended for this purpose and describe the data collection and processing path.

The offeror shall describe how the proposed software operates to sent and receive data. Included in this description is detailed discussion of how the limited bandwidth is used to best advantage to maximize the number of users and minimize transmission time. In addition, the Offeror should clearly and functionally describe any middleware that is interposed between the application program and the communication programs.

8.7.13 User Interface

It is desired that the user interface be a graphical ~~user~~**web browser-style** interface **that offers Internet similar screens and functionality**. ~~Responses to data queries are displayed in a browser-based interface that offers an Internet similar screen and functionality.~~ The user interface should be customizable for a variety of agency needs and reports. The software interface requirement for the existing agencies is described in Table 8-4. The SI shall provide the software and training to allow the development of custom screens. It is desirable that the interface use hypertext mark-up language (HTML) as the basic presentation language and Extensible Markup Language (XML) as a data representation standard.

COV ~~D~~**d**esire**s** that software buttons and function keys shall be used.

The ~~I~~interface shall ~~have the following functionality~~**provide formatted query and response screen forms to support all the functional requirements of the VSP CAD interface defined in Appendix L**:

~~□Formatted screen query forms are provided for the following categories:~~
- ~~□Articles (by serial number and description)~~
- ~~□Boats (by hull number and/or state registration number)~~
- ~~□Guns (by serial number, manufacturer, and/or model number)~~
- ~~□Persons (by state drivers license number or name, date of birth, and sex)~~
- ~~□Vehicles (by state registration or vehicle identification number)~~

~~□Searches of the following databases are performed based on the category NCIC, VCIN, CPIC, DMV, NLETS, STOLEN, WANTED, and MISSING. Information returned may include the following:~~
- ~~□License~~
- ~~□Registration~~
- ~~□Physical description of person or item (vehicle, boat, gun, or article)~~
- ~~□Outstanding wants and/or warrants~~
- ~~□Missing or stolen reports~~
- ~~□Concealed weapon permits~~

~~□Additional MCT functionality:~~
- ~~□Car to Car (or user to user) text messaging.~~
- ~~□VCIN free-form text format for submitting database queries.~~
- ~~□System user inquiry - such as system status, user identification, etc.~~

~~□MCT system control functions – such as send/receive messages, view reports, etc.~~

8.7.14 Peripheral Ports

It is desired that the mobile computer terminal supports a 3.5-inch diskette drive and a CD-ROM drive.

8.7.15 Technician MCT Use

The SI shall provide an access point (fixed connection) to the Intranet at each transmitter site, communications center, and network control center adjacent to the equipment for a technician's use. This access point will provide a secure path across the Intranet for authorized technicians to directly access maintenance information, instructions, drawings, and other data. Each fixed radio location (microwave radio or land mobile radio) and console location (both dispatch and network control) shall have this access. **It is** ~~H~~**h**ighly desired **that**~~, give~~ the technicians **have** wireless access to the alarm system via the MCT.

8.8 Mounting Requirements

The terminal shall be securely mounted with brackets and protectors. It is desired that the SI use vehicle computer mount model LT-5200 from D & R Electronics, Inc. or COV approved equivalent. This mounting shall be designed to fully secure the MCT in the vehicle during normal use as well as during pursuit, accident avoidance and other high-speed operations.

Mounts are also expected to be available for a variety of vehicles including police and off-road vehicles (sport utility vehicles) and watercraft. Additionally, the following requirements shall be met:

8.8.1 Key Lock

The MCT mount must be designed so that the MCT cannot be removed without a key. The locking mechanism must not interfere with the operation or adjustment of the MCT.

8.8.2 Installation

Installing the mount or the MCT in the mount shall be accomplished in such a manner so as not to jeopardize the safety of the vehicle. The MCT is not to interfere with the air bag deployment zone. Clear instructions are to be provided to allow the installation or removal of the MCT from the mount. The Offeror shall certify in their proposal that a correctly installed MCT will not impair the functioning of any vehicle safety system, including, but not limited to passive restraint or air bag system in accordance with the vehicle's manufacturer's guidelines. The installation must also assure that operator manipulation of the mount will not cause any MCT cables to become detached from the MCT. Further, operator adjustment of the mount must not cause cable wear or bending less than the minimum bend radius of the associated cable.

Installation and test procedures shall be provided to COV for their approval. These procedures shall meet manufacturers guidelines where available, however, at a minimum, installation procedures shall include a power-on test, log-on test, and one data query for all or a statistically valid sample of units. Following installation, the SI shall verify proper MCT operation for all units.

8.8.3 Viewing Positions

When installed, the MCT is desired to be viewable and useable by either an authorized passenger or the driver while in their normal seated positions. The mount should allow a vertical adjustment of at least five inches and rotate 80° (40° right or left from the vehicle centerline.) Positive locking should be provided. Locking can be either in several positions or continuously in any position. It is desirable for the mount to have the capability to rotate below horizontal and to be moved towards and away from the user.

Mounting must not interfere with the viewing or operation of the Land Mobile Radio Control head or access to or operation of any of the public safety equipment (i.e. lights, siren, portable radio). **The Mounting bracket shall be installed and inspected as part of the mobile radio installation. Visibility of a functioning dispatch radio control head shall be tested for each installation.**

Recording and security processes shall meet the following Virginia CJIS requirements as described in Appendix M.

8.14 Message Switch

The message switch must interface between the network control processor, CAD (as described in Appendix L), and the Intranet. The message switch will be responsible for receiving mobile computer terminal data requests, accessing proper data bases, acquiring requested information and routing this information to the network controller for distribution to the requesting entity. The message switch must support all peripheral data equipment including hard disk drives, logging printers, system consoles, data modems and standard computer interfaces.

8.15 System Performance

8.15.1 Message Transmission Reliability

Message transmission reliability is based on a fully loaded, single channel system with 3000 mobile computer terminals, maximum message size of ~~350~~**2000** characters, minimum message size of ~~50~~**100** characters, and average message size of ~~150~~**1000** characters**, both inbound and outbound**. Average transmission rate is anticipated to be 10 messages per hour per mobile computer terminal. The Offeror shall provide ~~estimates~~**a minimum guarantee** of ~~the~~ system reliability.

Where the Offeror proposes a system in which the voice and data share the same channels or equipment, the Offeror shall clearly describe how these two needs are allocated as well as how the data traffic will be kept from interfering with priority radio traffic.

8.15.2 System Throughput

The system through-put is defined as the percent of correctly recorded messages of average length sent and received within the maximum system through-put time, with one activation of the send button. System throughput shall exceed 95% under coverage design considerations of section 6 and the loading considerations defined in Appendix A. The maximum system throughput time for a message of length **should** -be five (5) seconds. This time period is measured from talk-in initiation until the time the message is acknowledged in the talkout direction, as indicated on the mobile computer terminal. This maximum system throughput time -appl**ies**~~y~~ to messages sent to and from the dispatcher and messages sent vehicle to vehicle. The Offeror shall provide in their proposal the calculations necessary to support their estimated system loading.

The throughput defined above should be maintained with the understanding that the microwave system will also be supporting the physical layer of the VSP-LAN. The microwave system is discussed in Section 7 and the data network is discussed in Section 9 of this specification.

8.15.3 Data Transmission

Standard forms and data files shall be stored in the terminal's memory such that only variable and update information need be transmitted over the radio system.

8.15.4 Message Acknowledgement

When a message is transmitted in either direction the receiving device **must** transmit an acknowledgement. If the transmitted message is not ~~received~~**acknowledged** within 30 seconds, the user- receive**s** an audible and visual alarm indicating that the message was not received.

It is desired that the system function in a store-and-forward mode where messages are queued for delivery when the receiving unit is **with**out ~~of~~ radio communication whether briefly or for an extended period. Queuing occur**s** at the originating MCT or at the message server depending on where the message originates. An operator warning should be provided when messages are **queued for all VCIN queries**~~undelivered. Operator notification is not required for brief queuing (<10 minutes)~~**.** ~~provided none of the volume level alerts are reached it is if the message is a VCIN query~~.

The system shall be designed so that no messages are undelivered without alerting the sending unit or individual.

8.15.5 Message Traffic Loading Analysis

The Offeror shall provide calculations in their proposal showing that the mobile computer terminal system can meet the message transmission reliability and system throughput time specified above. The traffic analysis shall be based on the number of units described in appendix E.

8.16 Optional Accessories

8.16.1 Bar Code Reader

A bar code reader is desirable for the MCT unit. This reader should be capable of reading driver license bar coding. A visual indication and a user selectable aural tone will be provided when a code is successfully read. Prior to sending any data from the MCT, the bar code reader should cause a representation on the MCT of the decoded data for verification. The capability to edit or add notes to the file prior to sending is to be provided.

This device should be mounted to the vehicle in a secure manner.

8.16.2 Biometric Device

A biometric identification device may be provided for fingerprint capture. A fingerprint capture device shall be compliant with Federal Bureau of Investigation (FBI) NCIC 2000. It will be capable of complete mobile operation without power or data connection to the MCT during the collection of the fingerprint. Once the print is collected, the device should allow downloading through the MCT. It is desired that the fingerprint device meet the same environmental characteristics as the MCT.

8.16.3 Automatic Vehicle Location

Automatic vehicle location (AVL) may also be provided. This system should indicate the position of the subject vehicle either continuously or upon interrogation by the dispatching agency.

The Offeror should also provide an option for AVL based on the global positioning system (GPS). This AVL option includes the GPS antenna and interfaces directly with the radio, independently of the MCT. On query, this device will provide latitude and longitude.

8.16.4 Vehicle Mounted Printer

A ~~V~~**v**ehicle mounted printer ~~(~~that does not interfere with existing radios ~~(~~including low-band~~,)~~ and radar ~~(all bands used)~~ equipment ~~and does~~**may be provided.** ~~not draw~~**The** power **requirements of the printer shall not** ~~to~~ interrupt ~~radio transmission,~~**simultaneous operations of radio transmitters,** public safety lights, **and speed detection equipment** ~~radar operations simultaneously~~ while the air conditioner is running.~~)~~

8.17 Mobile Computer Terminal **Demonstration and** Testing

~~All MCTs shall be installed with the LMR radios as described in Table 4-2. The purpose of the mobile computer testing is to demonstrate to the reliability of the system and MCT units under field conditions. This demonstration will utilize a fully equipped patrol vehicle that can be viewed at the pre-proposal conference. This testing will be performed prior to acceptance to each phase.~~

8.17.1 ~~Process~~ **Demonstration**

~~The SI shall provide and install a mobile computer terminals for testing, in a fully equipped VSP patrol car, at a mutually agreed place and time. These terminals must be production line units selected at random. The mobile computer terminals will transmit data over the RF system. The terminals shall have the following minimum capabilities.~~

~~□Vehicle to Vehicle data transfer~~
~~□Vehicle to Dispatcher data transfer~~
~~□Dispatcher to Vehicle data transfer~~
~~□Word processing capabilities~~
~~□Status reporting capabilities~~
~~□VCIN queries (including databases accessible from VCIN)~~
~~□Computer Aided Dispatch status and commands~~

The SI shall provide four mobile computer terminals for COV evaluation and testing. Three of these units will be delivered to the COV Project Manager and one to the Engineer. These units will be complete in all respects including all software and any optional hardware. The Commonwealth intends to conduct robust functional tests of the software, hardware, and interfacing. The Intranet, microwave system, and RF systems must be completed to the point where testing using those systems can be completed.

With the stand alone units above, the SI shall also provide and install mobile computer terminals for testing, in fully equipped cars equivalent to VSP patrol vehicles, at a mutually agreed place and time. These terminals must be production line units selected at random.

The purpose of this mobile computer demonstration is to establish the reliability of the system and MCT units under field conditions. This demonstration will utilize a fully equipped patrol vehicle that can be viewed at the pre-proposal conference. This testing will be performed prior to acceptance to each phase.

Following the satisfactory completion of these functional tests and any remedial action by the SI, and prior to installation of any mobile computer terminals, the COV Project Manager shall provide a written Notice to Proceed after recommendation by the Engineer.

8.17.2 **Radio Frequency** Testing

~~The Offeror shall provide a test plan which will demonstrate all functions of the mobile computer terminals operating as stand alone units and transmitting data as~~

~~described above. The COV Project Manager and the Engineer will conduct acceptance testing for the mobile computer terminals based on this test plan and other testing the COV deems necessary. The Phase 1 Commonwealth Review period is expected to last at least three months. The SI must analyze and document all failures occurring during this period. The SI may not modify, repair or replace any mobile computer terminals without approval of the COV Project Manager and the Engineer during this Commonwealth Review period. At the end of the Commonwealth Review, the SI must repeat all production tests and compare each result to the units original production tests.~~

~~Function testing of the overall system and bench testing of all major components will also be done at this time. The results of this test must be submitted to COV Project Manager and the Engineer for review and approval.~~

~~The Offeror shall provide a separate mobile computer terminal system test plan explaining how the mobile computer terminal system will be tested for message transmission reliability and system throughput. System acceptance of test requirements specified in Section 4 shall apply. The test plan must be supplied to the COV Project Manager and the Engineer for approval 90 days prior to the start of testing.~~

After the Notice to Proceed issued in item 8.17.1, all MCT's shall be installed with the LMR radios as described in Table 4-2. Testing of the radio frequency portion of the MCT system is conducted under the requirements of section 6.5 of this document.

8.17.3 Computer Functionality Testing

The Offeror shall provide a separate mobile computer terminal system test plan explaining how the mobile computer terminal system will be tested for message transmission reliability and system throughput. System acceptance of test requirements specified in Section 4 shall apply. The test plan must be supplied to the COV Project Manager and the Engineer for approval 90 days prior to the start of testing.

At a minimum, testing shall include the following capabilities:

- **Vehicle to Vehicle data transfer**
- **Vehicle to Dispatcher data transfer**
- **Dispatcher to Vehicle data transfer**
- **Word processing capabilities**
- **Status reporting capabilities**
- **VCIN queries (including databases accessible from VCIN)**
- **Computer Aided Dispatch status and commands**

The SI shall provide for COV approval a test plan that will demonstrate all functions of the mobile computer terminals operating as stand alone units and transmitting data. The Phase 1 Commonwealth Review period is expected to last at least three months. The SI must analyze and document all failures occurring during this period. The SI may not modify, repair or replace any mobile computer terminals without approval of the COV Project Manager and the Engineer during this Commonwealth Review period. At the end of the Commonwealth Review, the SI must repeat all production tests and compare each result to the units original production tests.

8.18 Proposal Requirements

The Offeror shall include in the proposal the following information:

- **Detailed design description**
- System block diagram

- Description of operation
- List of hardware and software
- Guaranteed specification for each major component
- Approach to collecting racial profiling data
- Message queuing requirements and system interactions for message delivery ~~delays.~~ **delays (Grade of service (GOS).**
- **Expected mobile data coverage operability limit in terms of bit error role (BER)**

The Offeror shall provide a list of and price for the additional equipment required on the Pricing Forms provided in Section 13.

8.19 System Software Design

8.19.1 Performance and Availability

The system shall be designed to send and receive data at least 99.9% of each 24-hour period. In the event of system unavailability or failure, a manual backup mode must be provided which provides for local entry and retention of data entered. When the system returns to operation, all data entered during the back-up operation must be processed automatically without data loss. Alarm indications must accompany any period where back-up operations are entered.

8.19.2 Audit and Logging

Each system event must have an audit trail associated with the event. This audit trail will be sufficient to establish the date, time, operator identification, input source and status of the function performed.

The audit trail and the data submitted must be available for supervisory review and reporting by commonly available data management programs. It is desired that tools be provided to allow searches and data retrieval from this log.

8.19.3 Multiple Agencies

The system shall be capable of supporting multiple command sets to provide or limit resource system accesses based on individual agency and user needs. For example: The VSP CAD command set defined in Appendix L shall only be made available to users who require and are authorized access to VCIN. The mobile client interface for these commands shall not be installed on an unauthorized user's MCT.

The system ~~must be~~**should be** -capable of multiple reports designed by different agencies for a variety of purposes. The system should allow the retention and distribution of these reports without adversely affecting MCT performance. It is desired that COV have the capability to remotely update agency specific MCT forms without affecting other MCT users. The Offer should describe their implementation of this process in their proposal.

All form and report changes are under the direction of the COV Project Manager.

8.19.4 Software Code Control

A. Commercial Products (operating system, office programs)

A list of licenses and where they are assigned shall be provided. For each program installed on a MCT, original program source (CD, DVD, etc.) is to be provided as required under the Installed Software section of this specification.

Where a product activation scheme has been enabled on commercial software, it is desired that the SI deliver MCT's where the activation sequence has been completed and the units are ready for field operation. The SI shall advise the COV Project Manager of the specifics of the activation sequence and when reactivation may be required.

B. Developed Code ~~(mobile data browser)~~

Where code has been developed for this project, one complete copy of the source code and the development tools shall be provided. Also all patches, interim releases, drivers, dynamic load libraries (DLL) shall be provided. This material is retained in the event that any software becomes corrupt or that unexpected behavior is noted in the system operation. Should this material be proprietary, notification must accompany any response to this solicitation.

8.20 Documentation

8.20.1 System Documentation

Complete and accurate documentation shall be provided with each MCT. This documentation should include functional manuals, operator manuals for the computer and software, program documentation and trouble shooting guides. The trouble shooting guides should be designed to allow local identification and problem rectification. Trouble shooting guides must provide problem recognition and resolution at a user (operator) level and technician level. The user (operator) level is designed to provide simple corrective actions that can be accomplished in the field by untrained individuals. Technician level guides are designed to provide detailed troubleshooting information and guidance for technically qualified personnel.

The offeror should refer to Section 4, for warranty requirements for Scenario 1 and Scenario 2, and operation and maintenance requirements for Scenario 1. The offeror should refer to Section 5 for the operations and maintenance requirements for Scenario 2.

8.20.2 Format

The documentation shall be available in both electronic and hardcopy format. Electronic documentation should be indexed and electronically stored such that other users can remotely access this data.

TABLE 8-4
AGENCY DATA REQUIREMENTS SUMMARY

Agency Data Requirements Summary	Internal Data Access	Information Stores	External Data Access	Future Needs
Department of Motor Vehicles	Customer Records	Intranet "Knowledge Base"	VCIN	DMV Digitized Images
	Email System	VLIC & DLG Procedures	NCIC	AFIS Transmission
	NADA Valuation Guide		PIN	DMV Investigative Files
			NLETS	SSN Cross Check
			ICJIS	NICB Shipping Records
Virginia State Police	VCIN, CAD, VSP LAN	Communications Server, STARS Server, SPHQ Server(s)	**VCIN, DMV, DGIF**	**NCIC 2000 and GIS Information**
Department of Transportation	VDOT Intranet		VOIS	ICAS
	Financial Management System (FMSII)		Internet to FEMA	BMS
				PMP
				Future VOIS Phases
				AVL/Vehicle Status
Federal Agencies				

9.0 WIDE AREA DATA NETWORK

This section describes the incorporation of a statewide Intranet utilizing the Microwave Network, and capable of interconnecting the 19 participating agencies. This wide area data network will be configured initially for the agencies currently operating in a Mobile Data environment

The rapid dissemination of trustworthy data from a myriad of sources to the mobile law enforcement community or the other elements of state government are increasingly important. This data may take a variety of appearances from simple text and pictures to complex drawings, maps, and huge searchable databases and documentation. Data and information flow is bi-directional. Considerable field generated data is transmitted through the command structure or to other Commonwealth agencies and users.

This wide area data network can also allow a significant cost saving to the Commonwealth. Direct cost savings will be achieved through leveraging the existing and upgraded microwave communications network to provide for servicing this additional network traffic. It can be highly cost effective to utilize existing capacity and additional capacity in the existing/upgraded microwave network than to pursue or continue the use of dedicated or leased telecommunication lines. Additional cost savings and gains in effectiveness will be achieved as field personnel (such as law enforcement personnel) remain on station longer and ~~more accurate reports~~**reports that are more accurate** are filed quickly and electronically. Further, this network contains provisions to assist in the maintenance of mobile data, microwave and land mobile radio sites since maintenance and repair information will be available via the network. Technician time will be more effective since maintenance, repair, and configuration information will be rapidly available.

Security and reliability are also essential attributes of this public safety grade network. The data traversing the network demands the highest level of information security since it will include details about in-process investigations, information about threat assessments and other highly sensitive data. Maintaining a private network can help limit the number and severity of attacks that a data network will receive. Similar security may not be possible or be ~~a good deal~~ more difficult to achieve in a leased line system.

The system will also be tasked to carry time sensitive data including disaster recovery (Department of Emergency Management), district office communications during weather emergencies (Virginia Department of Transportation), and emergency telephone and data service (Virginia State Police).

The offeror should refer to Section 4, for warranty requirements for Scenario 1 and Scenario 2, and operation and maintenance requirements for Scenario 1. The offeror should refer to Section 5 for the operations and maintenance requirements for Scenario 2.

The Systems Integrator (SI) shall have the ultimate responsibility to **procure** ~~implement~~**, implement** and provide technical support for a working Intranet. This responsibility includes hardware, software, databases, programming and transport media.

Initially, the SI will establish the Intranet control site at the backup control facility at SPHQ. When the control facility (also at SPHQ) is available, this functionality will be relocated in accordance with the overall migration plan with the Intranet backup remaining in the backup control facility.

9.2 Conceptual System Layout

The conceptual drawing attached (Figure 9-1, sheet 1) is provided as guidance to the development of the wide area data network. Other designs are encouraged and will be considered where they offer an equivalent level of **functionality and** ~~performance at a lower cost or offer~~**performance at a lower cost or offers** significant performance enhancements.

9.3 Implementation and Migration

The implementation of the intranet will parallel the phased project implementation as defined in Table 4-2A-D of this document with the following overlay defined below. The Offeror shall describe in their proposal how these implementation and migration specifics are to be implemented and how the future phases(s) are anticipated to be implemented.

The Computer Aided Dispatch (CAD) switch resides on the VSP Internal network (100.15.x.x). The STARS Intranet will be connected to this network. This CAD interface is not available for non-VSP users. Mobile users will be able to connect to their internal agency databases and servers and prevented from connecting servers for which they are not authorized access.

Commonwealth employees currently using or expecting to be connected to CapWIN shall be migrated to STARS Intranet as their primary data network. The STARS Intranet will be directly connected to the CapWIN network/switch. CapWIN participants will be supported as any other agency and, unless authorized, CapWIN participants will not be connected to the VSP CAD. Where available and as discussed elsewhere in this

specification STARS participants may be connected to a secondary commercial data network.

9.3.1 Agencies Connections

The following agencies, as identified in Table 9-1, will have operational intranet access provided as part of the first four phases of this project.

- Department of Environmental Quality (DEQ) connections will be accomplished in concert with the microwave and land mobile radio upgrades for each phase. This will facilitate the continued use of their mobile computer terminals. Section 8 of this specification describes their current mobile data operations.

This class of service will include a firewall, router, and Channel Service Unit/Data Service Unit (CSU/DSU) in addition to the Intranet interconnect equipment. Where microwave equipment is used as the Intranet connect media, this class of service receives the basic level of microwave service. Microwave interconnection shall be used for all VSP offices; other requesting agencies may be connected by other means. The Offeror shall identify in their proposal alternate connection methods, their benefits and their costs. These alternate connection methods will be reviewed by the COV Project Manager and the requesting agency for a decision on which method should be used.

9.4.2 Class II Service

This service is designed for larger offices that already have an existing network. This level of service adds Intranet service to this existing network. A firewall and router are added to the existing network. Where microwave equipment is used as the Intranet connect media, this class of service receives multiple DS1 microwave service. Microwave interconnection shall be used for all VSP offices; other requesting agencies may be connected by other means. The Offeror shall identify in their proposal alternate connection methods, their benefits and their costs. These alternate connection methods will be reviewed by the COV Project Manager and the requesting agency for a decision on which method should be used.

~~9.4.4~~ **9.4.3** Class III Service

This service is restricted to the Virginia State Police (VSP) Division Headquarters, the Prime Control and the Backup Control Sites. This service provides the major interconnection point for each VSP division and mobile computer terminals (MCTs). All mobile data to and from the MCTs shall be handled at these locations.

9.5 Number of Users

~~It is desired that the~~ **A scalable** wide area data network **shall** be designed so that in the future it may be expanded to accommodate a minimum of 20,000 stationary users and an additional 10,000 mobile users. The current and future distribution of the STARS Network user community is described in Appendix E.

9.6.6 Upgrades

Given the expected evolution in technology during the period of this agreement, the design must allow renewal and replacements at the lowest economic unit. Software and equipment drivers should also be able to be upgraded without significant effort or degradation of network performance. All equipment and software changes shall be approved by the COV Project Manager prior to implementation.

The Offeror shall describe in their proposal a formal **continuous** process ~~, for~~ **to** remain~~ing~~ aware of any security concerns with any proposed or installed upgraded equipment. Where patches or upgrades are available to correct security problems, these may be installed promptly, upon the approval of the COV Project Manager.

It is highly desired that the system be designed with a scalable architecture to facilitate taking rapid advantage of advances in the evolution of data communication speed.

Where existing equipment (legacy equipment) is reused or interconnected into the system, the SI shall ensure that this equipment will not degrade the Intranet. It is expected that the SI establish requirements for interconnecting equipment.

9.6.7 Expandability

It is desired that the system be designed to easily accommodate expansion. Over the initial five-year phase-in, the system should provide for a 25% growth per year in both users and data traffic. After this initial period, the **COV**~~system~~ anticipates the need to accommodate a 2-5% annual increase in users and a 5-8% annual increase in data traffic. It is desired that the SI employ technology that allows capacities of individual equipment to be increased without network degradation (scalability). The microwave network, as described in Section 7 of this document, has been specified to include provision for future links and capacity to support the expansion of the Intranet in a future solicitation.

Where other users may be authorized by the COV to utilize the Intranet, their use shall not degrade the primary use of the Intranet to support the COV. The SI shall develop outside user requirements that include, the bandwidth available, the number of users authorized to use any outside account. The COV reserves the right to discontinue any non-participating users.

9.11 Training and Support

The Commonwealth desires that sufficient training and support be provided to assure that the wide area data network remains functional through anticipated operational conditions. ~~For Scenarios 1 and 2, t~~**T**he Offeror shall describe in their proposal a detailed System Administrator, which shall be a COV person **(Scenario 1)** located in the Network Control Center~~,~~ training plan. All training and system operating documentation shall comply with the requirements of Sections 4 and 5.

Support shall include assisting COV personnel in resolving compatibility problems that may arise during the interconnection, migration, or operation of the Intranet. These problems may include, but are not limited to existing (legacy) hardware, software, databases, programming and transport media.

9.12 Baseline Equipment Specifications

9.12.1 Firewall

It is desired that the firewall be sized to handle the anticipated traffic for the class of use. All network traffic originating from outside the wide area network passes through a firewall. Both transport and network layer information is examined during as packets access the firewall. The firewall requires secure access to adjust or change any parameter. It is desired that firewalls be located in secured locations at the VSP Division Headquarters.

It is desired that firewalls have reporting and alarming capabilities as provided for in the Alarms and Reporting section.

9.12.2 Message and Data Router

It is desired that routers sufficient to handle the expected system loading conditions be used. A router may only respond to specific addresses. It is desired that routers be

located in secure locations. Routers require secure access to adjust any parameters. It is desired that router tables be backed up remotely (preferably automatically) inside the firewall-protected area.

The typical interconnection path will be through the microwave network. VSP interconnection shall be via Microwave. Microwave requirements are contained in Section 7 of this specification.

9.14.2 Other Connection Options

The SI shall provide alternative interconnection requirements for access to the Intranet for the Department of Environmental Quality and the Department of Mines, Minerals, and Energy. These interconnections may include commercial access methods (ISDN, TI, fiber optic, and/or dial-up modem) or other Commonwealth sources such as existing Department of Information Technology (DIT) connections and/or COVANET (a contract between the Commonwealth and MCI WorldCom). The corresponding benefits of each type of connection shall be described. Integral to the provision of these other connection options shall be the full implementation of the security requirements contained elsewhere in this section.

9.15 Cutover Plan

The SI shall develop a cutover plan for the orderly overall transfer of the Intranet fixed equipment from the initial operation at the backup control facility to the control facilities when these permanent facilities become available. This plan should provide for the minimal disruption of essential network services. The Intranet cutover plan should and integrate well and may be included with the overall migration plan. The cutover plan shall be provided for COV review and approval. The Offeror shall provide a basic Cutover Plan as part of their proposal.

~~9.15~~**9.16** Proposal

The Offeror shall include in their proposal the following information.

- System block diagram, with connection options available commercially and dedicated COV circuits
- Description of operation
- Demonstration of how the proposed system meets %utilization and collision rate numbers
- The implementation and migration plan
- List of equipment, including the server(s) anticipated
- Guaranteed specifications for each major component
- List all equipment hardware and software proposed. Alternates may also be provided where cost or system efficiency can be enhanced.

- List the anticipated Intranet performance metrics
- A complete description of the security design, including means to assure transmission security, prevention of external and internal unauthorized access and unauthorized use by otherwise authorized individuals.
- Documentation of the qualification(s) of the network development, maintenance and installation personnel
- Description of the training and technical support to be provided and the period over which this support will be provided (separate descriptions for Scenario 1 and Scenario 2).
- Description of the measures anticipated for electrical protection including surge suppression and uninterruptible power supplies.
- Description of the means to assure back-up's are made.
- **Basic Cutover Plan**

10.0 TRANSMITTER SITES

10.1 Scope

Systems Integrator (SI) shall provide complete and usable transmitter sites in accordance with general guidelines included in this section of the specifications. These facilities shall be coordinated with and shall support systems specified in other sections of the specifications. The offeror should refer to Section 4, for warranty requirements for Scenario 1 and Scenario 2, and operation, maintenance, training and spares requirements for Scenario 1. The offeror also should refer to Section 5 for the operations and maintenance requirements for Scenario 2.

Section 10 defines these physical facilities required for the tower sites portion of the system. Physical facilities include site preparation, radio towers, radio buildings, HVAC, backup power ac system, UPS systems and dc power, electric power systems and lighting, and other work associated with the named features, as required for complete and finished facilities. Generic designs for new sites and site upgrades are attached as figures at the end of this section. The SI shall modify these generic designs to incorporate site-specific conditions and to provide detailed design for each site. Unless otherwise specified herein, ~~the Commonwealth of Virginia (COV) expects~~ the SI **shall** ~~to~~ submit to the COV Project Manager and the Engineer for review a 35-percent design forty-five (45) days prior to submission of final design and a 100-percent design forty-five (45) days prior to start of Phase Construction for each site. The 35-percent design shall consist of drawings catalog cuts manufacturers information and other documents to fix and describe the size and character of the project construction at each site. The final submission is expected to be complete, detailing aspects of construction and identifying materials and equipment by such information as name, size, and manufacturer's catalog number. These submissions shall include four (4) hardcopy sets and one (1) electronic set of drawings and specifications provided to COV, and three (3) hard copy sets and one (1) electronic set of drawings and specifications to the engineer. The SI ~~is expected to~~**shall** meet with COV Project Manager and the Engineer in Richmond, Virginia, to review each submission and shall provide written responses to each of the COV Project Manager or the Engineer comments. After the review process has been completed satisfactorily, the SI is expected to issue four (4) sets of final drawings and specifications and one (1) electronic copy of drawings and specifications for the COV to use.

Also, provide two (2) hard copy sets and one (1) electronic set of drawings, and specifications to the engineer. The COV will then issue a Notice to Proceed for the construction. Work may not start prior to this notification. After completion of construction, as-built drawings and electronic files shall be provided to COV within sixty (60) days.

10.1.1 Sites Convenient for the Commonwealth

Section 10 includes, in general, any ~~and~~ sites to be used for the system.

Facility specifications for "Prime Control Site Building Construction" are included in Section 11. Facility specifications for "Communication Centers" are included in Section 12. Additional sites may be required based on the SI's specific design requirements.

It is highly desired that the existing VSP LMR and MW sites be considered for use in STARS before any others. It is highly desired that Commonwealth-owned properties be considered for additional sites before other sites; however, the SI's design shall be the final determination for site locations. It is expected that the 95% coverage guarantee, as described in Section 6 of this specification, will determine the placement of new sites.

10.1.2 Entering Sites

Prior to entering any existing site, SI shall notify and coordinate with the COV Project Manager.

10.1.3 Standards

Standards, codes, and regulations referred to in this section shall be the latest revision in effect, unless otherwise noted.

10.1.4 **View Tree (**Warrenton Training Center**)** and Quantico Marine Base

If the Offeror chooses these sites, SI's responsibility is limited to design, drawing, and furnishing of equipment and materials. Site labor and maintenance will be COV's responsibility.

10.1.5 Proposal Requirements

Refer to Section 4. Also, note paragraph 10.11.4, "New Towers," subparagraph F and G, paragraph 10.14.2, "Prequalified Manufacturer's," of Section 10.

10.2 Design, Installation, and Quality Control

10.2.1 General Design Basis of Physical Facilities

Physical facilities serve as hosts to protect radio systems from harm over the course of each radio system's useful life. Facilities are expected to withstand severe weather, including, but not limited to, hurricanes, blizzards, and ice accumulations. Where indicated by region, terrain, or scientific data, facilities are expected to be designed to survive and protect radio system from expected severity of floods or earthquakes. SI is expected to certify whether or not a facility is located in a zone where floods or earthquakes are prevalent.

Backup energy systems are expected to provide electricity to radio system without human intervention when offsite power is not available or is of insufficient quality. Physical facilities are expected to protect radio system from the public and to protect the public from potentially hazardous parts or emissions of the radio system, as indicated in Occupational Safety and Health Act (OSHA) rules and regulations, and 47 CFR, of the Federal Communications Commissions, Rules, Regulations, and Bulletins.

SI is responsible for designing and installing facilities provided under this procurement in accordance with applicable codes, statutes, and ordinances imposed by governmental bodies having jurisdiction. These legal requirements are expected to be augmented by referenced industry standards, this procurement document, and SI's internally developed design/installation procedures. Where references conflict, the most stringent requirements shall be followed. In the absence of other direction, as a minimum, facilities shall be designed and installed in accordance with most recent revision of Virginia Uniform Statewide Building Code, BOCA National Building Code, and the National Electric Code (NFPA 70). SI shall be responsible for providing, promoting, and requiring worker compliance with safe, clean, and sanitary construction work sites that meet or exceed OSHA or other regulatory requirements.

COV Project Manager ~~assisted by the Engineer~~ will provide limited administration of construction and construction monitoring for new or modified facilities. SI shall assist and cooperate in these administration and monitoring activities.

Site visits will be made at these critical construction points:

- Following excavation and rebar placement and grounding ring placement and prior to placement of concrete or backfill. COV requires coordination with the COV Project Manager and at least seven (7) days prior notice to inspection. Rebar and ground grid at any one site must be placed prior to this inspection.

- For placement of shelter, COV requires coordination with the COV Project Manager and at least seven (7) days prior notice to inspection.

- For electrical, UPS, grounding, generator test, and building systems tests. COV requires coordination with the COV Project Manager and at least seven (7) days prior notice to observe tests.

- COV requires coordination with the COV Project Manager and at least seven (7) days prior notice to witness tower upgrades.

- **The SI shall provide an independent engineer registered in the Commonwealth of Virginia to oversee, monitor and approve all new tower and tower upgrade construction. The SI's engineer shall visit the sites during tower construction, grounding, RF transmission line installation, and antenna placements. The SI's engineer shall provide all site visit reports and final approval documentation to the COV Project Manager.**

10.2.2 Reuse of Existing Facilities

SI is expected to certify and document the contention that existing facilities reused for COV system meet specifications herein for new facilities.

10.2.3 Qualification of Personnel

Design and construction personnel are expected to have appropriate training, experience, and certifications to complete assigned tasks. SI shall be responsible for overseeing all SI personnel, including subcontractors. Design and construction subcontractors are expected to be registered professionals licensed to perform business in COV. Professional registration is required for design submittals. SI personnel that work on site are expected to successfully pass a Virginia State Police background check before entering a site. Visitors are not permitted without the prior approval of the COV PM and shall be escorted (visually) by SI approved personnel at all times.

10.2.4 Preconstruction Meeting and Monthly Teleconferences

Prior to start of **construction**~~each tower site modification or replacement~~, SI is **shall** ~~expected to~~ participate in a **separate** pre-construction meeting for each site at a location coordinated with COV Project Manager. In addition, SI, tower vendor, and other vendors ~~as required are~~**shall be** expected to participate in monthly teleconferences.

The SI shall provide an independent engineer registered in the Commonwealth of Virginia to lead an additional pre-construction meeting for each individual tower modification or replacement. This engineer shall also participate in the monthly telephone conferences.

10.2.5 Control of Measuring and Test Equipment

Measuring and test equipment used for installation and/or for determining compliance with quantitative values is to be part of a documented calibration control program. Torque wrenches, which are to be used whenever a torque value is specified, are to be included in calibration program. Multimeters used for checking continuity do not need to be included in calibration program; however, multimeters used for measuring quantitative values are to be included in calibration program. Rulers, tape measures, and bubble levels should be in good condition; however, they do not need to be included in calibration program.

Geotechnical investigations and reporting shall be in accordance with ASTM D 420, "Standard Guide to Site Characterization for Engineering Design and Construction Purposes" for new work. Geotechnical report is to be submitted to COV~~, with a copy to the Engineer~~ for review and comment.

10.6 Survey

SI is to provide a complete topographic and utility survey of area where tower sites will be constructed or modified. Surveyors shall be registered in the COV.

10.7 Concrete and Soil Testing

10.7.1 Independent Testing Firm

SI is expected to contract directly with one or more independent testing firms and will be expected to maintain control of soil classification and compaction and concrete testing. SI shall pay for concrete and soil testing. SI shall provide the COV Project Manager with a schedule of testing and a testing firm assignment for each site. SI is expected to coordinate testing times directly with testing firm.

10.7.2 Civil Inspection

COV expects to be notified of excavations and reserves the right to inspect excavations and reinforcement placement. Concrete and soil testing reports are to be submitted to the COV Project Manager ~~and the Engineer~~ for review and comment.

Where settlement occurs in trenches or where trenches are improperly backfilled, trenches shall be reopened to depth required for proper compaction, refilled and compacted, with surface restored to required grade and compaction. These reopened trenches are then to be mounded over in open areas and smoothed off.

10.8.10 Plastic Marking Tape

Warning tapes are to be installed directly above pipe and conduit at a depth of 6 inches below finished grade, unless otherwise indicated. Tape color is to be as specified and is expected to bear a continuous printed inscription describing specific utility.

Utility	Color
Electric Conduits	Red
Water Systems	Blue
Telephone	Orange
Sewer Systems	Green

10.8.11 Compaction

Degree of compaction required is expressed as a percentage of maximum density obtained by test procedure presented in ASTM D 1557. Fill and backfill materials are to be moistened or aerated as necessary to provide a moisture content that falls within 3 percent of either side of optimum, unless otherwise approved in writing by the ~~Engineer~~**COV Project Manager**.

Minimum compaction effort required for various fills, backfills, and subgrades is to be as follows:

Fill, Backfill, and Subgrade Compaction	Percent of Maximum Density
Under buildings, structures,	

or towers or adjacent to buildings, structures, or towers	95
Under exterior concrete slabs, including related utility trench backfill and scarified subgrades	90
Under utility trench backfill in other areas	85

Field-density tests are expected to be performed in sufficient number to ensure that specified density is being obtained. Tests are to be performed in accordance with ASTM D 1556 or with ASTM D 2922 and ASTM D 3017. Written reports of each test and its location ~~are to~~**shall** be ~~promptly~~ submitted to the ~~Engineer~~ **COV Project Manager within 5 days of test completion**. At least one field-density test is expected to be performed per lift for each 2,000 square feet of fill or subgrade under buildings and structures and for each 4,000 square feet under embankments, but not less than 1 test per lift. At least one field-density test per lift is to be performed for each 500 linear feet of fill placed under roadways. Locations of field-density tests are to be referenced to the construction baseline system. If tests indicate that required density has not been obtained, material is to be removed, replaced, and recompacted to specify density and retested for correct density, as specified hereinbefore.

Field-density check tests may be performed by the COV Project Manage**r** ~~or the Engineer~~ to ensure compliance with requirements specified above. If tests indicate that required density has not been obtained, SI is to remove, replace, and recompact material to specified density at no additional expense to Commonwealth. The SI shall bear the expense of any further re-testing by COV or the Engineer.

10.9.2 Concrete Requirements

Cement shall conform to ASTM C 150, Specification for Portland Cement. Aggregate shall conform to ASTM C 33, Specification for Concrete Aggregates. Reinforcing bars shall conform to applicable ASTM standard. Water shall be potable. COV will approve admixtures prior to their use. Additional minimum requirements are located in Table 10-1, Concrete Schedule.

10.9.3 Foundations

SI shall provide final foundation designs, to the COV Project Manager ~~and the Engineer~~, that are best suited for chosen structures and most economical for subgrade conditions and site. Foundations for steel towers shall be designed in accordance with TIA/EIA-222. Calculations, SI's working drawings, location plans, and shop drawings of foundations shall be sealed by an **SI** Engineer registered in the Commonwealth of Virginia. Concrete pads for exterior equipment as well as foundation slabs for equipment shelter buildings shall meet or exceed requirements shown in Figure 10-2.

10.9.4 Construction Foundation Submittals

Sealed drawings, supporting calculations, and associated documentation are to be submitted, to the COV Project Manager ~~and the Engineer~~, for approval for the following:

- Concrete Mix Design
- Building Foundation Slab (including anchors)
- Concrete Pads for Exterior Equipment (including anchors)
- Tower Foundations (including anchors)
- Structure Excavation
- Reinforcing Steel Placement

10.10.4 Chain-Link Fencing

A. General

SI is expected to provide chain-link fencing, locking gates, and the accessories required to provide fencing and security for radio sites. Fencing is to be provided for new sites and where required for additions to existing sites. Fencing shall be required at communication tower guy anchors. Gates are to be equipped with light reflectors to increase their visibility at night. Signage in accordance with 47CFR and the Commonwealth of Virginia RF Radiation Exposure Compliance Plan (contained in Appendix K) is to be provided. (Refer to Section 4.) Fence design and installation are to be in accordance with the generic fence details included in Figures 10-5, 10-6, and 10-7. In Scenario 1, COV will provide locks for gates into sites upon acceptance. In Scenario 2, the SI shall provide locks for gates into sites and provide a master key to each site to the COV.

B. Fence Submittals

For each site, the SI shall submit for review, to the COV Project Manager ~~and the Engineer~~, site-specific drawings and catalog data for each fence component.

C. Intruder Alarm

An intruder alarm is to be provided at each exterior gate and is to be electrically wired to the alarm system in the shelter building. The Offeror is to propose a discrete transmitter site security camera system, as an option, which can be operated in concert with the LMR alarm system. It is desired that the individual site cameras be displayed to the VSP dispatcher at the respective division and all cameras be displayed at the two network control centers. If this is proposed, the Offeror shall also clearly define the loading such a security system will have on the network.

D. Report

SI is expected to document structural condition, existing antennas, and other loads. Inspection should also document antennas for required computer model study. Documentation must consist of general evaluation from the initial review of documentation and visual review, plus any structural analyses done on authorized towers.

E. Structural Conditions

Towers that exceed 85 percent of their capacity based on individual member stresses should be categorized "Tower Replacement Necessary." The report is expected to indicate ~~approximate~~ number of members that are overstressed (exceeding 85-percent capacity) to aid in determining if reinforcing existing tower is feasible.

F. Content

SI shall provide to the COV Project Manager with four (4) hard copies of the report and one (1) electronic copy, and the Engineer with four (4) hard copies of the report and one (1) electronic copy containing photographs, schematic drawings, and descriptions of:

- Existing tower condition
- Identification of any defective members
- Methodology and acceptance criteria used in the analysis
- Capacity of tower to support proposed loading
- Recommendations regarding reinforcement, as appropriate
- Calculations

G. Review

COV Project Manager and Engineer will review report for completeness and adherence to specific criteria referenced but is not be responsible for the recommendations and conclusions reached. Recommendation and conclusion shall be the responsibility of the SI.

H. Teleconference

A teleconference ~~will be~~**shall be** held with the SI, COV Project Manager, and the Engineer to discuss report's findings. Upon completion of this review, COV Project Manager will provide written documentation **(based upon** advis**e from**~~ing~~ the Engineer**)** ~~and~~**to** the SI on what actions are to be taken for each tower.

I. Final Report

Five (5) hardcopies of the final report shall be delivered to the COV Project Manager with an additional two (2) copies to the Engineer. One (1) copy of the report in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager with an additional copy to the Engineer.

10.11.2 Upgrade Existing Towers

Existing towers to be upgraded shall meet same requirements specified for new towers.

10.11.3 Replacement Policy

Where towers are replaced, guyed towers may be replaced with either guyed towers, using existing space available at site, or with self-supporting towers. Self-supporting towers shall be replaced with self-supporting towers.

10.11.4 New Towers

A. Basic Code Requirements:

Loads for towers are to be in accordance with latest version of TIA/EIA-222 and the Virginia Uniform Statewide Building Code (VUSBC). Where VUSBC and EIA contain conflicting requirements, the more stringent requirements shall apply.

B. Wind Loads

Basic wind speeds shall be as shown in latest version of TIA/EIA-222, but shall be not less than 80 mph or less than local requirements. Wind forces and pressures shall be determined using appropriate coefficients that reflect effects of terrain surrounding each chosen tower site. Loads must be applied to proposed tower attachments, including such attachments as obstruction lighting, cabling, and antennas.

C. Ice Loads

Radial ice accumulation with a minimum thickness of 1/2 inch, but not less than local requirements, shall be assumed to occur on structural elements and equipment located on steel towers. Ice accumulation loads shall be applied in accordance with latest version of TIA/EIA-222 and shall be used to determine gravity loads and projected areas for wind loads. Unit weights of ice shall be as specified in latest version of TIA/EIA-222. Loads must be applied to proposed tower attachments, including such attachments as obstruction lighting, cabling, and antennas.

D. Load Combinations

Load combinations for towers shall be applied in accordance with latest version of TIA/EIA-222.

E. Additional Loads Reserved for COV Use

Required communications equipment on each tower, including existing antennas being moved from existing structures, shall receive loads and combinations of loads as stated herein, and those loads shall be distributed to steel tower. **Towers shall not be loaded beyond 85% capacity on any structural member. The SI shall provide the COV Project Manager documentation certifying this for any change to a tower.**

For towers, allowances are desired to be made in their design for additional loads of COV future equipment which include:

- One dB-224 receive antenna with cables and ladder.

G. Existing Loads

Existing loads that are to remain or that are to be transferred to replacement towers must be included in the analysis and design. The Offeror shall explain in their proposal the procedure for moving existing tenants in the proposal. SI is to physically remove existing loads not required after system completion. *VSP Infrastructure Evaluation Report* provided site information for the existing VSP infrastructure. This report will be made available through the COV Contracting Officer.

H. Tower Manufacturers

New radio site towers are to be manufactured self-supporting or guyed structures designed by a professional engineer according to industry standards. Towers are to be constructed of steel from one of the following manufacturers or COV approved equivalent. Guyed towers or self-supporting or monopole towers are to be used as indicated herein.

- Grasis Towers
- PiRod
- Rohn

I. Materials

Tower steel shall meet requirements of EIA standard and shall be hot-dipped galvanized in accordance with ASTM standards. Other steelwork shall receive one shop coat of rust-inhibitive red-oxide or zinc-chromate paint.

J. Erection

SI shall coordinate with the COV Project Manager at least two (2) weeks before excavation, forming, and setting of reinforcing steel is complete so that a representative can, at the representative's option, **observe**~~inspect~~ this work before concrete is poured.

In addition, the SI shall provide an independent engineer registered in the Commonwealth of Virginia, to inspect and approve all work associated with the construction and/or upgrade of the towers. Erection of structural steel shall be in accordance with applicable provisions of EIA standard. After steel tower has been erected, SI shall verify that tolerances are within required limits. Tower shall be grounded continuously during erection.

K. Ladder

A ladder furnished with climbing safety devices is to be provided for each new tower in accordance with TIA/EIA-222. Cable system safety devices manufactured by DB Industries, Safe-Loc, Toledo, or COV approved equal are to be provided. Two personnel belts for the climbing safety device are to be provided with each tower.

L. Obstruction Marking and Lighting

Where provided, tower obstruction marking and lighting shall be in accordance with FAA requirements and FCC radio frequency authorizations. Where option exists to use a painted tower or strobe lights, strobe lights are to be used in lieu of paint. Dual lighting systems are to be used where FAA offers this option. Required notifications shall be made before tower is erected. FAA notifications, except for the initial Notice of Proposed Construction or Alteration (FAA Form 7460-1), are to be SI's responsibility. FAA notifications for each site are to be shown as specific milestones on master schedule. Lighting equipment provided by SI shall be same throughout entire network to permit commonality of spare parts. A lighting control system with required alarms shall be provided. These alarms are to be wired to site alarm. The network control console should receive notification, if any tower light fails.

M. Cable Installation ~~Recommendations~~**Mandatory Requirements**

- Ice Bridge: Supported with angle brackets and threaded rod assemblies to support the angel brackets.
- Ladders: Remain separate for COV and 3rd Party Users.
- Mounts: ~~3 foot~~**3-foot maximum** intervals for 100 mph wind rating ~~at ,5~~**at, 5** inch radial icing conditions.

- Hoists: Use at ~~200 foot~~**200-foot maximum** intervals.
- Grounding: Minimum of 3 grounding kits are required for each transmission line – one at the top of the vertical run, one at the bottom of the vertical run, and one prior to entry into building/shelter. All grounding is expected to meet the requirement of Appendix C.
- Cable Entry: For single or multiple entries a rubber boot, clamp and galvanized steel plate shall be used.
- Weatherproofing Kits should be used to protect the transmission lines~~,~~ connectors~~,~~ and the antenna-to-jumper interface.

All parts shall be Andrew or COV approved equivalent.

N. Design Management

After SI's final tower report has been accepted and COV has issued Notice to Proceed, SI shall provide the following:

- Design development documents for replacing or upgrading agreed upon towers, including such items as structural elements and rerouting of cables. SI shall furnish to COV four (4) hard copies and one (1) electronic copy with 35-percent design submission. ~~An additional two (2) hard copies and one (1) electronic copy are to be provided to the Engineer.~~

- Upon approval of design development documents, SI shall furnish four (4) hard copies and one (1) electronic copy of 100-percent design documents to the COV Project Manager to review. ~~An additional two (2) hard copies and one (1) electronic copy are to be provided to the Engineer.~~ **The SI shall provide an independent engineer registered in the Commonwealth of Virginia to review and approve the design, and attend the review conference in Richmond, VA for the 100-percent design documents.**

- Upon approval of design documents, SI shall provide five (5) hard copies and one (1) electronic copy of final design documents **to the COV Project Manager**. ~~An additional two (2) hard copies and one (1) electronic copy are to be provided to the Engineer.~~

10.12.6 Building Submittals

SI shall submit shop drawings, to the COV Project Manager ~~and the Engineer~~, for approval of buildings, in accordance with paragraph 10.1, "Scope." Shop drawings are expected to include floor plans, which locate current and future equipment. Shop drawings shall be submitted for approval ninety-(90) days prior to building delivery.

10.13 Building Systems

10.13.1 HVAC for Radio Room

Heating and cooling system for radio room is to be sized and selected on ambient conditions for 99.6 percent winter and 1 percent summer, as indicated in 2001 ASHRAE Handbook Fundamentals for the nearest area applicable and shall also include a minimum of an additional 20-percent capacity for reasonable growth. Equipment is to be capable of maintaining an interior temperature between 70 and 75 degrees. Heating equipment for radio room is to be sized to heat the room without equipment heat loads being considered. Cooling system is to cool shelter with equipment, present and future, up and running. Future requirement is as described in Section 10.12.1, "Arrangement and Size." System shall consist of totally redundant units; either unit shall be able to carry the load. Redundant lead/lag controls with alternating timer allowing approximately equal operating time on each air-conditioning unit are to be provided.

Rooms housing batteries are to be ventilated with an exhaust fan sized according to battery manufacturer's recommendations. Fans are to be operated by a hydrogen detector and/or a timer. Makeup air is expected to be provided through positive closing, screened louvers or through the cooling system.

SI is to include heat load calculations, at design review, along with as-built documentation. Load calculations are to include anticipated future loads.

10-10. SI ~~is expected to~~**shall** provide additional capacity in the **electrical service, the** cables feeding panelboards, the panelboards, ~~and~~ the circuit-breaker**s, emergency generator, automatic transfer switch and UPS.** ~~capacity and in the breaker capacity serving~~ **The additional**~~extra~~ capacity **is** specified in Sec**t**ion 10.12.1, "Arrangement and Size." Load calculations shall be provided **to the COV Project Manager**.

One essential design specification is that end equipment is to be associated with one of the following buses:

- Critical (Red) Bus: Radio and other critical equipment powered from the UPS.

- Protected (Orange) Bus: Required peripherals, such as HVAC, with only emergency generator backup or critical equipment having its own battery backup, such as emergency lights.

- Service (Ivory) Bus: Equipment, outdoor lighting, and maintenance power receptacles not required for radio system operation. This bus will be de-energized upon loss of off-site commercial power. Cable for service bus equipment or receptacles is not to be run in the same conduit or raceway with critical or protected bus cable.

Second essential design specification is that manual switches shall be provided to allow complete bypass and isolation of UPS cabinet and automatic transfer switch cabinet. Switches shall be configured to allow parallel electrical supply before the components are isolated. This requirement is necessary to allow major maintenance of these single-point failure components without prolonged downtime for radio site. Out-of-position switches, such as bypass operation, shall be an input to the radio system alarms.

C. Surge Suppression

Load side of automatic transfer switch shall have appropriately designed surge-suppression devices installed.

course, SI ~~is to~~**shall** provide five (5) copies of course outline, to the COV Project Manager, for approval and one (1) copy to the ~~e~~**E**ngineer. Refer to Section 4, for all warranty issues and Scenario 1 maintenance and Section 5, for Scenario 2 maintenance issues relative to maintenance and warranty issues.

10.14.3 Generator Location

Emergency generator, transfer switch, line surge suppressors, service disconnect, and associated equipment are to be located either in a separate room of the equipment shelter or in a separate enclosure. System is to be designed to facilitate on-site full-load testing. A receptacle is to be placed outside the building so that a mobile generator can be connected to the electrical system in case of extended inoperability of the primary emergency generator unit. Provision should also be made for fueling the generator from an external propane tank, should the primary fuel system be inoperable or empty. Emergency generator operating instructions are to be posted in the room.

10.14.4 Starting System, Crankcase Heater, and Jacket Water Heater

Batteries are to be maintenance-free type with sealed cells. Battery chargers are to be a float/equalize design. Crankcase heater and jacket water heater are being provided to facilitate cold weather starting.

10.14.5 Fuel Tank and Fuel System

Liquid propane tank is to be an approved design, buried and installed in accordance with applicable building codes. Liquid propane system shall also meet requirements of NFPA 58, Liquefied Petroleum Gas Code. Fuel storage tanks are to be buried where possible or otherwise surrounded by bullet resistant enclosures, as previously described. Removable metal grating is to be provided to protect vulnerable portions of fuel system from falling ice.

10.14.10 Service Contract

As an option, for Scenario 1, at least thirty (30) days prior to performance test, generator supplier should provide for a preventive maintenance service contract that starts on the day of final acceptance.

Contract is to include routine preventive maintenance required by the manufacturer and NFPA 110, with the exception that weekly and monthly inspections of batteries are to be excluded.

For Scenario 2, SI shall provide all maintenance required by manufacturer and NFPA 110.

10.14.11 Generator Certification Test

Upon completion of engine-generator set installation and after providing thirty ~~(~~ **(**30) ~~days~~**day's** prior notice, SI shall perform performance testing. Tests are to comply with NFPA 110. COV Project Manager or representative(s) ~~and the Engineer~~ will witness testing. Following tests will demonstrate:

- Simulation of power failure by removing power service to normal side of transfer switch
- Startup and cool-down demonstration (5 minutes)
- Load testing consisting of 5 minutes at 50-percent rated load and 15 minutes at 100-percent rated load utilizing a load bank
- Simulation of power return by reapplying power service to normal side of transfer switch
- Crank-cycling performance test as specified in NFPA 110, Cycle Crank Test

11.0 CONTROL SITE BUILDINGS CONSTRUCTION

11.1 Scope

Systems Integrator (SI) shall provide complete and useable Prime Control Site and Backup Control Site, in accordance with general guidelines included in this section of the specifications. Facilities shall be coordinated with and support systems specified in other sections of this specification. Section 11 defines requirements for the Backup Control Site and Prime Control Site. The offeror should refer to Section 4, for warranty requirements for Scenario 1 and Scenario 2, and operation and maintenance requirements for Scenario 1. The offeror should refer to Section 5 for the operations and maintenance requirements for Scenario 2.

Backup Control Site will involve approximately 3,500 square feet of renovation to an existing warehouse at the Virginia State Police Headquarters, 7700 Midlothian Turnpike, Richmond, Virginia. This facility will then house communications equipment and operations to support the statewide system. Equipment that is to be used in this facility is to be determined by SI. Criteria included herein represent the general approach to renovating the facility. The Backup Control Site may be used temporarily as the Prime Control Site if it is necessary to bring Division 1 on line in accordance with the implementation plan of the FCC provided radio frequency authorizations.

Prime Control Site is to be a new facility of approximately 20,000 square feet. This facility will house communications equipment, operations, and other functions to support statewide land mobile radio (LMR), microwave, mobile data, alarm, and Intranet systems. SI is to determine equipment that is anticipated to be used in this facility.

Conceptual designs for the Backup Control Site and Prime Control Site are attached as figures to the end of this section. Unless otherwise specified herein, Commonwealth of Virginia (COV) expects SI to submit for review to the COV Project Manager a schematic design (forty-**five** (45) days prior to submission of design development), a design development (forty-**five** (45) days prior to submission of final design) and a final design (forty-**five** (45) days prior to start of Phase Construction) for each site. The schematic design will include evaluation and confirmation of the building program, and drawings and other documents illustrating the scale and relationship of project components.

The design development will consist of drawings catalog cuts, manufacturers information, and other documents to fix and describe the size and character of the project as to architectural, civil, structural, mechanical and electrical systems, materials and such other elements as may be appropriate. The final design will consist of complete construction documents consisting of drawings and specifications detailing all aspects of construction and identifying materials and equipment by such information as name, size and manufacturer's catalog number.

All submissions shall include five (5) hardcopy sets and one (1) electronic set of drawings and specifications for COV, and three (3) hard copy sets for the Engineer. SI ~~is expected to~~**shall** meet with the COV Project Manager and Engineer in Richmond, Virginia, to review each submission and ~~is expected to~~**shall** provide written responses to each comment provided by the COV Project Manager and the Engineer. After review process has been completed satisfactorily, SI shall issue five (5) sets of final drawings and specifications to the COV Project Manager, with two (2) additional sets to the Engineer. COV will then issue a Notice to Proceed for construction. Work may not start prior to receiving this notice. After construction is complete, as-built drawings shall be provided within sixty (60) days. The SI shall provide one (1) electronic copy of drawings and specifications to the COV Project Manager**.**~~, with one additional copy to the Engineer.~~

11.1.1 Sites

Sites are located at the Virginia State Police Headquarters in Richmond, Virginia.

A. Backup Control Site

Backup Control Site is located in an existing warehouse behind Virginia State Police Headquarters (SPHQ).

B. Prime Control Site

Prime Control Site is to be constructed in the existing, large dirt parking lot on west side of SPHQ radio tower.

- Become knowledgeable about project site, including utilities and other infrastructure, other planned construction, as well as vehicular and pedestrian traffic patterns.

- Once sufficient space program information has been developed and substantially approved by the COV Project Manager, develop conceptual design approach to project.

- Develop and document Conceptual Project Cost Estimate.

- Meet with the COV Project Manager and the Engineer to discuss, review, and further evaluate conceptual design plan.

- Refine and finalize preferred design plan and cost estimate, in accordance with consensus of the COV Project Manager and the Engineer.

- Complete other required basic design and construction services as required by COV Construction and Professional Services Manual for Architects/Engineers (A/E Manual).

11.2.3 Reuse of Existing Facilities

SI must certify and document SI's contention that any existing facilities that are reused for the COV system must meet the specifications herein.

11.2.4 Qualification of Personnel

Design and construction personnel are expected to have the training, experience and certifications to complete assigned tasks. SI shall be responsible for oversight of SI-controlled personnel, including subcontractors. Design and construction subcontractors are to be registered professionals licensed to perform business in the COV. Professional registration is required for design submittals. SI personnel that work on site ~~are expected to~~**shall** successfully pass a Virginia State Police background check. **The SI shall receive from the COV Project Manager approval before they enter a site. VSP background checks may take several weeks.** Visitors are to be escorted (visually) by SI **cleared**~~approved~~ personnel at all times.

11.2.5 Control of Measuring and Test Equipment

Measuring and test equipment used for installation and/or for determining compliance with quantitative values are to be part of a documented calibration control program. Multimeters used for checking continuity do not need to be in the calibration program; however, multimeters used for measuring quantitative values are to be included in the calibration program.

11.2.6 Construction Administration

COV Project Manager or ~~the Engineer~~ **representative(s)** will provide administration of construction and construction monitoring for the Backup Control Site and the Prime Control Site. SI shall assist and cooperate in administration and monitoring activities, and site superintendent ~~is expected t~~**shall**~~o~~ accompany COV's representative visits. Site visits are expected to be made at the following critical construction points:

- Following excavation and rebar placement and grounding ring placement and prior to placement of concrete or backfill. SI shall coordinate with the COV Project Manager and provide seven (7) days' notice when the above are ready for inspection. Rebar and ground grid at any one site must be placed prior to this inspection.

- Regular visits to observe construction progress

- Electrical, UPS, generator test, and building systems tests**,**~~;~~ HVAC, Sprinkler System, etc. Provide one (1) week's notice and assist in coordinating inspection by COV.

- Substantial Completion Inspection. SI shall coordinate with the COV Project Manager when the facility is ready for a detailed substantial completion inspection and assist in coordinating inspection by COV. The COV Project Manager or representative(s) will make an inspection and provide a punch list to the Contractor for items deemed to be deficient. Within two (2) weeks, SI ~~is to~~**shall** perform the required action and to notify the COV Project Manager that SI is ready for a follow-up inspection. Substantial Completion will mean that construction, erection, and

installation is complete, that systems have been completed and tested and are up and running; that building accessories are operable and the facility has received a final cleaning with debris having been removed. If the facility does not have required degree of completion, the SI shall bear all expenses of the Commonwealth ~~and the Engineer~~ for additional final inspection(s).

11.3 Permits, Permissions, and Services

Refer to Section 4.

11.4 Survey

SI is to obtain a complete topographic and utility survey of the area where Prime Control Site will be constructed. Surveyors shall be registered in the COV.

11.5 Utilities

For Prime Control Site, SI is to coordinate, obtain, extend lines, and pay installation fees for utilities through local utility companies. In Scenario 1, SI shall pay facility utility bills until system acceptance. For Backup Control Site, in Scenario 1, COV will provide electric power to the extent that capacity is available; however, SI will be expected to extend the lines if necessary. For Scenario 2, SI will be responsible for all aspects of providing, maintaining, and paying for monthly charges

11.6 Geotechnical Investigation

SI is expected to obtain a subsurface investigation and foundation report for the Prime Control Site. Geotechnical investigations previously performed may be adequate, and additional test borings, as determined by Geotechnical Engineer, may not be required. Geotechnical Engineers registered in the COV and having at least ten (10) years' experience shall provide Geotechnical investigations and report. Geotechnical

investigations and reporting shall be in accordance with ASTM D 420, Standard Guide to Site Characterization for Engineering Design and Construction Purposes. Geotechnical report is to be submitted to the COV ~~with a copy to the COV Project Manager and the Engineer~~ for review and comment.

11.7 Concrete and Soil Testing

11.7.1 Independent Testing Firm

SI is to contract directly with one or more certified independent testing firms and shall maintain control of soil classification and of compaction and concrete testing. SI shall pay for costs for concrete and soil testing. SI ~~is expected to~~**shall** coordinate testing with the COV Project Manager and provide at least ten (10) days advance notice. SI shall coordinate testing times directly with testing firm.

11.8 Earthwork

11.8.1 Site Plan Construction Engineering Submittals

Conceptual Site Plan/Ground Floor Plan and Second Floor Plan for Prime Control Site is included as Figure 11-2 and Figure 11-3. SI is to modify the plan as required to address specific site conditions and to provide detailed design for the site. Detailed design is to include as a minimum the following:

- Access Road
- Parking
- Service Drive
- Running Track
- Location Plan for Site
- Erosion and Sediment Control Plan
- Grading and Utility Plan
- Landscaping Plan

HVAC systems shall be sized and selected on ambient conditions for 1 percent summer and 99.6 percent winter as indicated in 2001 ASHRAE Handbook Fundamentals for Richmond, Virginia, and is to include an additional 20-percent capacity for reasonable growth. Cooling equipment is to be capable of maintaining an interior temperature of 70 degrees Fahrenheit +/- 3 degrees. Cooling system is to be capable of cooling the building with equipment (present and future) up and running. Backup Control Site and control room of Prime Control Site are to have totally redundant cooling. Areas indicated to have backup cooling shall have totally redundant units with either unit able to carry the load. Lead/lag controls with alternative timer allowing approximately equal operating time on each air conditioner unit shall be provided. Provide outside-air quantities to meet applicable building codes. SI is to include heat load calculations with design reviews and with as-built documentation.

2. Backup Control Site ~~(3)~~

Spaces shall be served in accordance with the following table:

SPACE	SYSTEM
Electrical Room	Ventilated (a), Electric Room Heater
Fire Protection Room	Ventilated (a), Electric Room Heater
Toilets	Ventilated, Electric Baseboard Heat
Technical Areas (with Electronics) and Administration Offices	Constant-Volume DX-Packaged Cooling Units with Electric Heat (b)

Notes:

(a) Relative humidity will be controlled to a range of 20 to 60 percent.

(b) Relative humidity will not be controlled, but air-conditioning equipment will be selected at approximately 50-percent relative-humidity room condition.

(c) Ventilation rate is to be selected for room temperature 10 degrees warmer than the outside temperature (summer only). Presence of batteries may require extra ventilation.

(d) Coordinate temperature requirements with elevator equipment requirements.

(e) Control room HVAC units are to be connected to the emergency generator.

4. Operating and Maintenance Manuals

Sixty (60) days prior to installation, SI ~~is~~ shall provide two (2) sets of Operating and Maintenance Manuals for approval, by the COV Project Manager, for mechanical systems. SI shall provide four (4) final sets, within thirty (30) days after COV approval, of these manuals to the COV Project Manager ~~with an additional copy to the Engineer~~. One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager**.** ~~with an additional copy to the Engineer.~~

C. Plumbing

1. Backup Control Site

Provide for facility a new handicapped toilet using building's existing cold water and sanitary utilities. (Refer to Figure 11-1.)

SI shall test systems according to code and shall demonstrate operation of actuators and alarms. SI shall provide the COV Project Manager one (1) week's notice of this test so that COV Project Manager or representative(s) ~~and the Engineer~~ may witness test.

4. Operating and Maintenance Manuals

Sixty (60) days before the system is installed, SI shall ~~to~~ provide, to the COV Project Manager with an additional copy to the Engineer, for approval two (2) sets of Operating and Maintenance Manuals for fire protection systems. SI shall ~~to~~ provide four (4) final sets of these manuals to the COV Project Manag**er**~~er with an additional copy to the Engineer,~~ within thirty (30) days after manuals have been approved. One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager ~~with an additional copy to the Engineer~~.

E. Electrical

1. General

A complete workable electrical system is to be provided in accordance with applicable local authorities and codes.

2. Backup Control Site

Specific electrical requirements include, but are not limited to, the following:

- Replace existing service with a new 800-amp 208/120-volt, 3-phase service
- 750-Kw propane emergency generator system
- Surge protection

- Service (Ivory) Bus: Equipment, outdoor lighting, and maintenance power receptacles not required for radio system operation. This bus will be de-energized upon loss of off-site, commercial power. Cable for service bus equipment or receptacles is not to be run in the same conduit or raceway with critical or protected bus cable.

Second essential design specification is that manual switches are to be provided to allow complete bypass and isolation of UPS cabinet and automatic transfer switch cabinet. Switches are to be configured to allow parallel electrical supply before components are isolated. This requirement is necessary to allow major maintenance or complete replacement of these single-point-failure components without prolonged downtime for radio site. Out-of-position switches, such as bypass operation, are to be an input to the radio system alarms. (Refer to Section 6 for description of integrated alarm system.) Any alarm in the Prime Control Site building or Backup Control Site building shall notify an electronic technician (via an alphanumeric pager in the follow sequence: SPHQ technician, Division 1 technician, Communications Division Management; this process ends when a technician responds) as soon as an alarm is detected.

Service entrance and emergency generator output are expected to each have independent, appropriately designed surge-suppression devices installed. Additionally, because of potential operation with the UPS bypassed, critical (red) bus branch circuits are to be supplied with commercial off-the-shelf (COTS) surge-protection devices at the equipment end. ~~Devices shall~~**Devices ~~be~~shall be** Tripplite or COV approved equivalent, a brand with a history of reliable operation that provides lifetime equipment protection coverage of at least $50,000. Any warranty or financial protection shall be transferred to the Commonwealth once the system has been accepted.

Minimum conduit size is to be 3/4 inch, and conduit except underground conduit is to be of metal with a zinc coating (EMT or heavier construction). Conduits exposed to outside is to be rigid, not EMT.

Underground conduit is to be 2 inches or larger rigid PVC with a minimum of 20-percent excess capacity over code limits, or spare underground conduit is to be included. Radio transmission lines are to run neatly on ladders and are to be protected by a horizontal ice bridge. Drip loops or another method to prevent water entry into the shelter are to be utilized.

Sixty (60) days prior to completion of building construction, SI shall provide for approval two (2) sets of Operations and Maintenance Manuals for the electrical systems to the COV Project ~~Manager, with an additional set to the Engineer. This~~**Manager. This** information is to include such electrical system components as UPS, automatic transfer switches, motor generators, batteries and chargers, and security system. SI shall perform tests on the electrical system and shall submit certification to COV that the electrical system meets applicable local and national standards to support radio system. SI shall ~~to~~ provide four (4) final sets of these manuals, within forty (40) days after the manuals have been approved, to the COV Project Manager**.** ~~with an additional copy to the Engineer~~. One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager**.** ~~with an additional copy to the Engineer~~.

F. Grounding and Lightning Protection

Site grounding and lightning protection are to be in accordance with the National Electric Code and Appendix C of this document. SI is to provide lightning protection and grounding plans and details.

Grounding system is to be tested to ensure continuity and that ground resistance does not exceed 5 ohms. SI is to measure and certify ground resistance of each ground rod.

Under NFPA 110, emergency generator shall, as a minimum, meet requirements for a Type 60 (initiates within 60 seconds), functions without refueling for seven (7) days, Level 1 (protection of human life) device. Automatic transfer switch shall be provided with a manual bypass isolation feature to allow maintenance without interruption. Generator Operating and Maintenance Manuals shall be supplied with each generator unit.

2. Prequalified Manufacturers

Emergency generators are to be one of the following or COV approved equivalent:

- Caterpillar
- Kohler
- Onan

For Scenario 2, the SI should maintain as close as possible to the site a local service shop with an adequate stock of spare parts and trained mechanics. Location of this service shop shall be indicated in the proposal and in the 35-percent submission. For Scenario 1, the Offeror ~~is to~~ **shall** propose training, spare parts and maintenance as described in Section 4 of this document. If a generator set is necessary as a teaching aid, SI ~~is expected to~~**shall** provide one at the location in the COV where course is being offered. SI shall provide for COV Project Manager approval five (5) copies of course outline and training materials thirty (30) days before conducting the training course. Refer to Section 4, for all warranty issues and Scenario 1, Maintenance and Section 5 for all Scenario 2 maintenance issues.

3. Generator Location

Emergency generator, transfer switch, line surge suppressors, and associated equipment are to be located in electrical equipment room of Backup Control Site and in generator room of Prime Control Site. System is to be designed to facilitate on-site full-load

10. Service Contract

For Scenario 1, at least thirty (30) days prior to performance testing, generator supplier is to provide for a period of one (1) year a maintenance service contract (including preventative) starting on day of final acceptance. Offeror shall provide, as an option, SI provided maintenance (including routine preventive).

For Scenario 2, SI is to provide all maintenance required by manufacturer and NFPA 110, with exception that weekly and monthly inspections of batteries are to be excluded.

11. Generator Certification Test

Upon completion of the engine-generator set installation and after providing 30 days prior notice, SI shall perform performance tests to comply with NFPA 110. COV Project Manager or representative(s) ~~and the Engineer~~ will witness testing. The following tests will demonstrate:

- Simulation of power failure by removing power service to normal side of transfer switch
- Startup and cool-down demonstration (5 minutes)
- Load test consisting of 5 minutes at 50-percent rated load and 15 minutes at 100-percent-rated load utilizing a load bank
- Simulation of power return by reapplying power service to normal side of transfer switch
- Crank cycling performance test as specified in NFPA 110, Cycle Crank Test

12. Generator Certification Test Report

1. System Requirements

UPS shall meet requirements of National Electric Code (NFPA 70), Article 700 for Emergency Systems. It must also meet requirements for an emergency power system as defined in latest edition of Standard on Stored Electrical Energy Emergency and Standby Power Systems (NFPA 111) with the exception that SI may use an "unlisted" UPS that has: been proven reliable in other public safety radio systems, the required functionality specified in NFPA 111, and passes required tests of NFPA 111.

UPS must meet or exceed functional requirements for a Type 0 (no interruption of power), Class 0.25 (functions for 15 minutes at full load), Level 1 (protection of human life) device as specified in NFPA 111.

SI is to provide a site UPS unit that can continuously protect and condition power for a fully loaded critical bus during normal operation. It is also to supply uninterrupted operation for required time period upon loss of off-site and emergency generator power. System ~~is expected to~~**shall** be designed to facilitate on-site full-rated load testing of UPS unit. SI may propose more than one UPS unit for a site if it is justified because of site size.

2. Emergency Shutoff

UPS is to have an emergency shutoff switch on UPS cabinet. Additionally, provisions are to be made to de-energize facility by operation of a clearly marked emergency switch in proximity to circuit-breaker panel. To prevent inadvertent shut off, two actions are to be required to engage any emergency UPS shutoff switch, that is, lift a cover then push a switch or similar.

L. Controlled Shutdown

12.0 VSP COMMUNICATION CENTERS

12.1 Scope

The Systems Integrator (SI) shall upgrade the existing VSP communications centers to complete and useable communication centers in accordance with the general guidelines included in this section of this specification. These facilities shall be upgraded in coordination with the migration schedule provided in Section 4 and shall support the systems specified in other sections of the specifications. The offeror should refer to Section 4, for warranty, operation and maintenance requirements for Scenario 1.

Section 12 defines the requirements for the communication centers. Conceptual designs for each site are attached as figures to the end of this section. The SI shall develop concepts and provide detailed design for each location, as required in this section. Unless otherwise specified herein, ~~Commonwealth of Virginia (COV) expects~~**the** SI ~~to~~ **shall** submit for review to the COV Project Manager a schematic design forty-five (45) days prior to submission of design development), a design development forty-five (45) days prior to submission of final design) and a final design forty-five (45) days prior to start of Phase Construction) for each site. The ~~number of copies are~~**number of copies is** specified below. The schematic design will include evaluation and confirmation of the building program, and drawings and other documents illustrating the scale and relationship of project components. The design development will consist of drawings catalog cuts, manufacturers information, and other documents to fix and describe the size and character of the project as to architectural, civil, structural, mechanical and electrical systems, materials and such other elements as may be appropriate. The final design will consist of complete construction documents consisting of drawings and specifications detailing all aspects of construction and identifying materials and equipment by such information as name, size and manufacturer's catalog number.

All submissions shall include five (5) hardcopy sets and one (1) electronic set of drawings and specifications for COV and three (3) hard copy sets and one (1) electronic set for the Engineer. SI ~~is expected to~~**shall** meet with the COV Project Manager and the Engineer in Richmond, Virginia, to review each submission and shall provide written responses to each COV and Engineer comment. After satisfactory completion of the review process, SI shall issue five (5) sets of final drawings and specifications and one (1) electronic copy of drawings and specifications for the COV's use with two (2) additional hard copy sets and one (1) electronic set to the Engineer.

The COV will then issue a Notice to Proceed. Work may not start prior to this notice. After construction is complete, as-built drawings shall be provided within sixty-(60) days. The SI shall provide one (1) electronic copy of drawings and specifications to the COV Project Manager~~, with one (1) additional copy to the Engineer~~.

The SI shall not affect operations in a Communications center without the previous coordination of the COV Project Manager. The SI shall in writing **send** (also sent via email) an exact description of the possible disturbance, maximum length it may occur, and a backup plan how to restore full operations.

12.1.1 Locations

The communications centers are located at Virginia State Police (VSP) Division Headquarters throughout the state.

- First Division Headquarters – 9300 Brook Road, Richmond, Virginia Phase 1 – This phase shall be complete by July 1, 2003
- Second Division Headquarters – 15148 S.P. Road, Culpeper, Virginia, Phase 3 – This phase shall be complete by October 1, 2005
- Third Division Headquarters – Rt. 613 & Rt. 460, Appomattox, Virginia Phase 2 – This phase shall be complete by October 1, 2004
- Fourth Division Headquarters – 1186 E. Lee Highway, Wytheville, Virginia Phase 4 – This phase shall be complete by October 1, 2006
- Fifth Division Headquarters – 157 S. Military Highway, Chesapeake, Virginia Phase 2 – This phase shall be complete by October 1, 2004
- Sixth Division Headquarters – 3775 S. Main Street, Salem, Virginia Phase 4- - This phase shall be complete by October 1, 2006

Where references conflict, the most stringent requirement is to be followed. In the absence of other direction, as a minimum, facilities shall be designed and installed in accordance with the most recent revision of the Virginia Uniform Statewide Building Code (BOCA National Building Code) and the National Electric Code (NFPA 70). It is specifically noted that design shall comply with the Virginia Uniform Statewide Building Code, Chapter 11, "Accessibility," and with the Americans With Disability Act Architectural Guidelines, (ADAAG). SI shall provide, promote, and require worker compliance with safe, clean, and sanitary construction work sites that meet or exceed OSHA or other regulatory requirements.

12.2.3 Reuse of Existing Facilities

SI must certify and document SI's contention that any existing facilities reused for the COV system meet the specifications herein.

12.2.4 Qualification of Personnel

Design and construction personnel are expected to have appropriate training, experience, and certifications to complete assigned tasks. SI shall oversee SI-controlled personnel, including subcontractors. Design and construction subcontractors are to be registered professionals licensed to perform business in the Commonwealth of Virginia. Professional registration is required for design submittals. SI personnel that work on site shall successfully pass a VSP background check **(which may take several weeks)** prior to entering a Communications Center. -Subcontractors are to be escorted (visually) by approved SI personnel at all times. The SI shall not bring a visitor to a Communications Center. The absolute minimum required number of personnel shall be used in the upgrade of a Communications Center to ensure the security of the facility.

12.2.5 Control of Measuring and Test Equipment

Measuring and test equipment used for installation and/or for determining compliance with quantitative values is to be part of a documented calibration control program.

Multimeters used for checking continuity do not need to be in calibration program; however, multimeters used for measuring quantitative values are to be included in calibration program.

12.2.6 Construction Administration

COV Project Manager ~~and the Engineer~~ **or representative(s)** will provide administration of construction and construction monitoring for each site. SI shall assist and cooperate in these administration and monitoring activities, and SI's site superintendent ~~is expected to~~**shall** accompany COV's representative ~~and the Engineer~~ during these visits. Site visits will occur at the following critical construction points:

- Following excavation and rebar placement and grounding ring placement and prior to placement of concrete or backfill, SI shall coordinate with the COV Project Manager and ~~is expected to~~**shall** provide a minimum seven (7) days notice when the above are ready for inspection and assist in coordinating inspection by COV. Rebar and ground grid at any one site must be placed prior to this inspection.

- Regular visits to observe construction progress

- Electrical grounding, UPS, generator test, and building systems tests; HVAC, sprinkler system, etc. SI shall coordinate with the COV Project Manager and ~~is expected to~~ **shall** provide a minimum of one (1) week's notice, when the above is ready for inspection, and assist in coordinating inspection by COV.

- Substantial Completion Inspection. SI ~~is to~~**shall** advise the COV when each facility is ready for a detailed Substantial Completion Inspection. Within two (2) weeks, COV's Project Manager or representative(s) will make an inspection and within one (1) week provide a "punch list" to the Contractor for items that are deemed to be deficient. Within two (2) weeks, SI shall perform the required action and notify the COV's representative that the SI is ready for a follow-up inspection.

Substantial Completion shall mean that construction, erection, and installation are complete, that systems have been completed, tested, and are up and running, that building accessories are operable, and that the facility has received a final cleaning with all debris removed. If the facility does not have required degree of completion, the SI shall bear all expenses of the Commonwealth ~~and the Engineer~~ for additional final inspection(s).

12.3 Permits, Permissions, and Services

Upon receiving a Notice to Proceed, SI shall obtaining permits, permissions, and services. Fees and costs associated with facility permits, permissions, and services shall be the responsibility of the SI without cost to the COV unless specifically noted elsewhere.

12.4 Survey

SI is to obtain a complete topographic and utility survey of areas where additions to communication centers will be constructed. Surveyors shall be registered in the Commonwealth of Virginia.

12.5 Electric Power

SI shall coordinate, obtain, and pay installation fees for electric power through the local electric utility. SI shall pay new facility electric bills until system acceptance. SI will be expected to extend the lines if necessary.

12.6 Geotechnical Investigation

SI is responsible for obtaining a subsurface investigation and foundation report for each site. Geotechnical investigations previously performed on some sites may be adequate, and additional test borings, as determined by the Geotechnical Engineer, may not be required.

Geotechnical investigations and reports are to be provided by Geotechnical Engineers registered in the Commonwealth of Virginia with at least ten (10) years' experience. Geotechnical investigations and reporting shall be in accordance with ASTM D 420, "Standard Guide to Site Characterization for Engineering Design and Construction Purposes." Geotechnical reports are to be submitted to the COV Project Manager~~, with copies to the Engineer~~ for review and comment.

12.7 Concrete and Soil Testing

12.7.1 Independent Testing Firm

SI shall contract directly with one or more certified independent testing firms and shall maintain control of soil classification and compaction and concrete testing. SI shall pay costs for concrete and soil testing. SI ~~is expected to~~**shall** provide COV Project Manager ~~and the Engineer~~ with a schedule of testing and notify the COV Project Manager ~~and the Engineer~~ fourteen (14) days in advance and assist in coordinating witnessing of tests by COV, if COV desires to witness the test. SI ~~is expected to~~**shall** coordinate testing times directly with testing firm.

12.8 Earthwork

12.8.1 Site Plan Construction Engineering Submittals

Engineering submittals ~~are to~~**shall** be provided as specified previously in this section. Detailed design shall include as a minimum the following where applicable:

- Access Road
- Parking
- Service Drive
- Location Plan for Site
- Erosion and Sediment Control Plan
- Grading and Utility Plan
- Landscaping Plan

12.11.1 Arrangement

General arrangements for additions to the communications centers are included as figures in this section. Sizes indicated are minimum sizes. SI ~~is to~~ **shall** coordinate layouts with the space requirements and utility requirements of the equipment being furnished under this contract. In addition, SI shall coordinate with the VSP Data Processing to determine space and utility requirements for the CAD system and to schedule installation. Construction materials (exterior walls, roof, interior finishes, doors, and windows) are specified in Table 12-1. Facility additions shall be of similar inside finish as the original portion of the building, except the 6th Division Headquarters at Salem. At Salem, the interior finishes shall match the interior of the existing facility using more modern components. The exteriors of all communications centers shall match the existing exteriors. At the 6th Division Headquarters, the exterior of the new facility shall be ~~a~~ brick ~~veneer which~~**veneer, which** matches the newer portion of the existing building.

A. First Division Headquarters – Richmond, Virginia
See Figure 12-1.

B. Second Division Headquarters – Culpeper, Virginia
See Figure 12-2.

C. Third Division Headquarters – Appomattox, Virginia
See Figure 12-3.

D. Fourth Division Headquarters – Wytheville, Virginia
See Figure 12-4.

E. Fifth Division Headquarters – Chesapeake, Virginia
See Figure 12-5.

F. Sixth Division Headquarters – Salem, Virginia
See Figure 12-6.

G. Seventh Division Headquarters – Fairfax, Virginia
See Figure 12-7.

SI shall provide four (4) final sets, within thirty-(30) days after COV approval, of these manuals to the COV Project Manager ~~with an additional copy to the Engineer~~. One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager**.** ~~with an additional copy to the Engineer.~~

C. Plumbing

A complete and workable interior and exterior plumbing system is to be provided in accordance with applicable local authorities and codes. Utilities are to be extensions of the facilities' existing systems. Electric heaters can be used to heat domestic water. Location of the heaters should be considered to serve hot water locally. Roof drains or scuppers are to be provided with an overflow system.

D. Fire Protection

1. General

Fire protection systems shall be designed in accordance with the applicable requirements of local authorities and codes. Existing FM 200 systems serving the existing dispatch centers shall ~~be enhanced~~**be enhanced** to serve the existing dispatch center plus the addition. Unprotected Dispatch Centers shall be provided with an FM-200 system covering both the new and existing facilities. The new 6th Division Dispatch Center shall be provided with an FM-200 System. Systems shall be designed and certified by a NICET, Level 3 certified individual. Design calculation and layouts shall be submitted for review at the final design submission. The following is a tabulation of the current status of each Communications Center:

- First Division Headquarters – Richmond -Has FM 200 System
- Second Division Headquarters – Culpeper -Currently not protected

- Third Division Headquarters – Appomattox - Currently not protected
- Fourth Division Headquarters – Wytheville - Has FM 200 System
- Fifth Division Headquarters – Chesapeake - Has FM 200 System
- Sixth Division Headquarters – Salem -New Building
- Seventh Division Headquarters – Fairfax - Has FM 200 System

SI ~~is expected to~~**shall** test the system according to code and to demonstrate the operation of actuators and alarms. COV Project Manager ~~and the Engineer~~ require**s** one (1) weeks' notice of this test so that a COV representative(s) ~~or the Engineer~~ may witness the test at their option.

Sixty- (60) days prior to system installation, SI is shall provide five (5) sets of Operating and Maintenance Manuals for approval, by the COV Project Manager, for new fire protection systems. SI shall provide five (5) final sets, within thirty (30) days after COV approval, of these manuals to the COV Project Manager**.** ~~with an additional copy to the Engineer.~~ One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager**.** ~~with an additional copy to the Engineer.~~

E. Electrical

1. General

A complete and workable electrical system is expected to be provided in accordance with applicable local authorities and codes.

This requirement is necessary to allow major maintenance or complete replacement of these single-point-failure components without prolonged downtime for the radio site. Out-of-position switches (that is, bypass operation) are to be an input to radio system alarms.

Service entrance and emergency generator output shall each have independent, appropriately designed surge-suppression devices installed. Additionally, because of potential operation with the UPS bypassed, critical (red) bus branch circuits are to be supplied with Tripplite or COV approved equivalent surge-protection devices at the equipment end. Devices are to have a history of reliable operation in providing lifetime equipment protection coverage of at least $50,000. Any warranty or financial protection shall be transferred to the Commonwealth upon system acceptance.

Minimum conduit size shall be 3/4 inch, and all except underground conduit shall be of metal with a zinc coating (EMT or heavier construction). Conduits exposed to outside shall be rigid, not EMT. Underground conduit shall be two (2) inches or larger rigid PVC with a minimum of twenty (20)-percent excess capacity over code limits, or spare underground conduits shall be included.

Sixty (60) days before the construction of the building is complete, SI shall provide for approval, by the COV Project Manager, two (2) sets of electrical Operations and Maintenance Manuals for the electrical systems. These manuals are to include such electrical systems as the HVAC, fire protection, UPS, batteries, automatic transfer switches, motor generators, and security systems. SI shall provide four (4) final sets, within thirty (30) days after COV approval, of these manuals to the COV Project Manager ~~with an additional copy to the Engineer~~. One (1) copy of the manuals in Adobe Acrobat Format (PDF) shall be delivered to the COV Project Manager**.**

~~ with an additional copy to the Engineer~~. SI is expected to perform tests on the electrical system and to submit certification to the COV Project Manager that the electrical system ~~meets applicable~~**meets applicable** local and national electric standards to support the radio system.

F. Grounding and Lightning Protection

Site grounding and lightning protection is to be in accordance with the National Electric Code and Appendix C of this document. SI ~~is to~~**shall** provide electrical ground plan documents. System is to replace existing grounding system serving existing dispatch center and is to include the addition.

Grounding system is to be tested to ensure continuity and that ground resistances do not exceed five (5) ohms. Ground resistance of each ground rod is to be measured and certified by the SI.

Thirty (30) days before the performance testing is completed, SI ~~is to~~**shall** submit to the COV Project Manager ~~and the Engineer~~ the measured ground resistance of each ground rod and grounding system, indicating their location as well as resistance and soil conditions at the time the measurements were made. Ground resistance measurements are to be made in normally dry weather, not less than seventy-two (72) hours after rainfall, and with the ground electrode under test isolated from other grounds. Ground resistance is also to be measured from each piece of equipment to the ground electrode.

Existing underground grounding components that are reused are to be electronically traced and plans drawn to document the configuration. On new building at Salem 6th Division, and where required for extending protection to additions, the lightning protection shall be installed to provide the COV with UL Master Label C LPI certifications.

For Scenario 2, the SI shall conduct routine maintenance and operational testing of emergency generators in accordance with NFPA 70, Article 700-4(b), and NFPA 110, Chapter 6, until system acceptance. Following installation, emergency generators are to be exercised at least once a month to at least 30 percent of nameplate rating for 30 minutes.

I. Service Contract

At least thirty (30) days prior to the completion of the 30-day performance test, the SI, through the supplier of the generator, is expected to offer as an option a preventive maintenance service contract to COV for a period of one (1) year starting on the day of final acceptance.

The contract is to offer routine preventive maintenance required by the manufacturer and NFPA 110, with the exception that weekly and monthly inspections of batteries are to be excluded.

J. Generator Certification Test

Upon completion of the engine generator set installation and thirty (30) days before the performance test is completed, SI ~~is expected to~~**shall** perform the tests to comply with NFPA 110 code. COV Project Manager ~~and the Engineer~~ will witness the testing.

The following tests will demonstrate:

- Simulation of power failure by removing power service to the normal side of the transfer switch
- Startup and cool-down demonstration (5 minutes)
- Load testing consisting of: 5 minutes at 50-percent rated load and 15 minutes at 100-percent rated load in utilizing a load bank.
- Simulation of power return by reapplying power service to the normal side of the transfer switch

- Crank cycling performance test as specified in NFPA 110, Cycle Crank Test

K. Generator Certification Test Report

Following the tests and prior to the completion of the 30-day performance test, SI ~~is expected to~~**shall** submit a written or typed report showing the test results, including the following:

- Readings of instruments on the generator under test conditions
- Settings of time delays and actual timing of operations
- Date and time of the tests, a list of people witnessing the tests, and their company affiliation or representation
- List of failures that occurred during the test.
- Other pertinent information or commentary regarding the test which may aid in describing the test circumstances or results

L. Battery System for Microwave

Proposed microwave and multiplex equipment is to be powered from a nominal 24- or 48-VDC positive ground supply, allowing for float battery voltage variations.

Microwave radio, multiplex, and channel bank equipment may share DC battery sources with any two-way radio equipment if it is cost effective to do so. Currently, the COV is using -48 volts DC to power existing microwave radio equipment. Two-way radio equipment and microwave radio equipment operate from negative ground and positive ground, respectively. Any DC-DC converter equipment used so that both systems can operate from the same battery source must provide ground isolation between the two systems. Alarm indicators are listed in Section 6.

Battery racks are expected to be installed, assembled, and wired as a complete operation system. It is desired that vendor-recommended corrosion-resistant hardware be provided to facilitate long-life operation of the battery plants. Steel racks used to support the battery units should consist of acid-resistant material or coding protection. System is to be designed for easy access in the event batteries must be replaced. The system is to be seismically designed in accordance with Virginia Uniform Statewide Building Code.

M. Uninterruptible Power Supply (UPS)

1. System Requirements

UPS systems shall be provided and sized for the new additions. UPS is to meet the requirements of the National Electric Code (NFPA 70), Article 700, for Emergency Systems. The system is also expected to meet the requirements for an emergency power system as defined in the latest edition of the Standard on Stored Electrical Energy Emergency and Standby Power Systems (NFPA 111) with the exception that SI may use an "unlisted" UPS that has:

- Been proven reliable in other public safety radio systems,
- Required functionality specified in NFPA 111, and
- Passes required tests of NFPA 111.

UPS is expected to meet or exceed the functional requirements for a Type 0 (no interruption of power), Class 0.25 (functions for 15 minutes at full load), Level 1 (protection of human life) device as specified in NFPA 111.

SI ~~is expected to~~**shall** provide a site UPS unit that will continuously protect and condition power for a fully loaded critical bus during normal operation.

12.12.3 Security Requirements- 6th Division Headquarters – Salem

SI ~~is to~~**shall** provide a security system designed by a certified system designer for the 6th Division Headquarters that is to include the following:

- Card access control at the main entrance. System is to monitor and control off-hours access to the facility. A microprocessor-based control system is to be provided which logs the name, time, and date of entry.

- CCTV system to monitor main entrance. This camera will be monitored at the dispatch supervisor's desk who will then "buzz-in" (electronically release the door) for people to enter.

Subscriber LMR - Phase 1

OFFEROR: _____

Transportable Site

COV Owned Pricing Section - Subscriber LMR- Transportable Sites - Phase 1

0.00% Applied Escalation Per Centage Rate

0.00% Applied Discount Per Centage Rate

			After Discount Site Total	$0.00	Equipment		Installation
			TRANSPORTABLE SITE	$0.00	$0.00		$0.00
			SPECIAL EVENT TRANSPORTABLE SITE	$0.00	$0.00		$0.00

Item Number	Item Name	Notes Ref #	Number Required	Equipment Unit Cost	Equipment Total Cost	List	Unit Cost	Installation	Installation Total Cost
A	TRANSPORTABLE SITE - DRTS								
A.1	5 CH VHF REPEATER SUITE		1		$0.00				$0.00
A.2	RF CABINET CONTAINING MULTIPLEXER & COMBINER		1		$0.00				$0.00
A.3	SYSTEM MANAGER COMPUTER		1		$0.00				$0.00
A.4	SITE CONTROLLER COMPUTER		1		$0.00				$0.00
A.5	ALARM STATUS COMPUTER		1		$0.00				$0.00
A.6	DISPATCH CONSOLE		1		$0.00				$0.00
A.7	TELEPHONE INTERFACE PANEL		1		$0.00				$0.00
A.8	MICROWAVE INTERFACE PANEL		1		$0.00				$0.00
A.9	MOBILE DATA COMPUTER		1		$0.00				$0.00
A.10	MOBILE DATA UHF BASE STATION		1		$0.00				$0.00
A.11	CHARGING RACKS for 6 PORTABLES EACH		2		$0.00				$0.00
A.12	VHFP ORTABLE RADIOS		12		$0.00				$0.00
A.13	AC/GENERATOR		1		$0.00				$0.00
A.14	TRANSFER SWITCH		1		$0.00				$0.00
A.15	POWER DISTRIBUTION PANEL		1		$0.00				$0.00
A.16	GENERATOR FUEL TANK 36 HOUR		1		$0.00				$0.00
A.17	CRANK UP TOWER		1		$0.00				$0.00
A.18	TOWER TRAILER & ANCHORING KIT		1		$0.00				$0.00
A.19	RECEIVE & TRANSMIT ANTENNAS		1		$0.00				$0.00
A.20	MICROWAVE ANTENNA		1		$0.00				$0.00
A.21	MOBILE DATA ANTENNA		1		$0.00				$0.00
A.22	ADMINISTRATIVE PC		1		$0.00				$0.00
A.23	OTHER				$0.00				$0.00
A.24	OTHER				$0.00				$0.00
A.22	"RV" TYPE TRANSPORT VEHICLE		1		$0.00				$0.00
A.23	TRANSPORTABLE SITE TOTAL				$0.00				$0.00

Subscriber LMR - Phase 1

OFFEROR: _____

Transportable Site

COV Owned Pricing Section - Subscriber LMR- Transportable Sites - Phase 1

0.00% Applied Escalation Per Centage Rate

0.00% Applied Discount Per Centage Rate

	After Discount Sites Total	$0.00	Equipment			Installation
	TRANSPORTABLE SITE	$0.00	$0.00			$0.00
	SPECIAL EVENT TRANSPORTABLE SITE	$0.00	$0.00			$0.00

Item Number	Item Name	Notes Ref #	Number Required	Equipment Unit Cost	Equipment Total Cost	List	Installation Unit Cost	Installation Total Cost
A	TRANSPORTABLE SITE							
A.1	5 CH 800MHZ TRUNKED SYSTEM		1		$0.00			$0.00
A.2	150 MHz CONVENTIONAL REPEATERS		2		$0.00			$0.00
A.3	RF CABINET CONTAINING HYBRID MULTIPLEXER & COMBINERS		1		$0.00			$0.00
A.4	SITE CONTROLLER COMPUTER		1		$0.00			$0.00
A.5	TELEPHONE INTERFACE PANEL		1		$0.00			$0.00
A.6	RF CROSS CONNECT RADIOS w/POWER SUPPLY		4		$0.00			$0.00
A.7	SPARE RACK for ADDITIONAL RF CROSS CONNECT RADIOS		1		$0.00			$0.00
A.8	MDC & INTERFACE RADIO EQUIPMENT		1		$0.00			$0.00
A.9	CHARGING RACKS for 50 RADIOS EACH		2		$0.00			$0.00
A.10	PORTABLE RADIOS - COMMAND		5		$0.00			$0.00
A.11	PORTABLE RADIOS - STAFF		45		$0.00			$0.00
A.12	SPARE RADIO BATTERIES		75		$0.00			$0.00
A.13	DESK CHARGERS		10		$0.00			$0.00
A.14	PORTABLE RADIO TRANSPORT LOCKER		1		$0.00			$0.00
A.15	AC/GENERATOR		1		$0.00			$0.00
A.16	TRANSFER SWITCH		1		$0.00			$0.00
A.17	POWER DISTRIBUTION PANEL		1		$0.00			$0.00
A.18	GENERATOR FUEL TANK (36 HOUR)		1		$0.00			$0.00
A.19	CRANK UP TOWER		1		$0.00			$0.00
A.20	TOWER TRAILER & ANCHORING KIT		1		$0.00			$0.00
A.21	RECEIVE & TRANSMIT ANTENNAS		1		$0.00			$0.00
A.22	MOBILE DATA ANTENNA		1		$0.00			$0.00
A.23	SHELTER to ACCOMMODATE EQUIPMENT		1		$0.00			$0.00
A.24	HVAC EQUIPMENT for SHELTER		1		$0.00			$0.00
A.25	ELECTRICAL SERVICE WIRING for SHELTER		1		$0.00			$0.00
A.26	5.9 GHz SPREAD SPECTRUM TRANSCEIVERS		2		$0.00			$0.00
A.27	SPREAD SPECTRUM ANTENNAS		2		$0.00			$0.00
A.28	T-1 MUX		1		$0.00			$0.00
A.29	ADMINISTRATIVE PC		1		$0.00			$0.00
A.30	TRANSPORT & MONITOR SCREEN COVERS				$0.00			$0.00
A.31	"RV" TYPE VEHICLE				$0.00			$0.00
A.32	OTHER		1		$0.00			$0.00
A.32	SPECIAL EVENT TRANSPORTABLE SITE TOTAL				$0.00			$0.00

Subscriber MCT - Phase 3

OFFEROR: _____

Marine Resources

COV Owned Pricing Section - Subscriber MCT - By Agency - Phase 3

0.00% Applied Escalation Per Centage Rate

0.00% Applied Discount Per Centage Rate

			After Discount Total Per Agency	$0.00	Equipment		Installation
			Pre Discount Subscriber MCT Total	$0.00	$0.00		$0.00

Item Number	Item Name	Notes Ref#		Number Required	Equipment Unit Cost	Equipment Total Cost	List	Installation Unit Cost	Installation Total Cost
1	*MOBILE COMPUTING TERMINAL (MCT) SYSTEM*								
1.1	Data Modem			13		$0.00			$0.00
1.2	Mobile Computing Radio Units			13		$0.00			$0.00
1.3	Standard Mobile Radio Antenna			13		$0.00			$0.00
1.4	Standard MCT w/mount			12		$0.00			$0.00
1.5	Rugged MCT w/mount			1		$0.00			$0.00
1.6	Vehicle located Printer			13		$0.00			$0.00
1.7	3.5" Disk Drive			13		$0.00			$0.00
1.8	MCT memory loading Equipment			1		$0.00			$0.00
1.9	Other					$0.00			$0.00
1.10	Other					$0.00			$0.00
1.11	Other					$0.00			$0.00
	SUBSCRIBER MOBILE COMPUTER COSTS SUB-TOTAL					$0.00			$0.00

CONSOLES - Phase 1

OFFEROR _____

Emergency Management

COV Owned Pricing Section - CONSOLES - Phase 1

0.00% Applied Escalation Per Carriage Rate

0.00% Applied Discount Per Carriage Rate

CONSOLE GRAND TOTAL with DISCOUNT TOTAL CONSOLE COSTS

$0.00

$0.00

$0.00

Equipment $0.00 $0.00

Installation $0.00 $0.00

Item Number	Item Name	Notes Ref#	Number Required	Unit Cost	Equipment Total Cost (with Escalation)	Unit Cost	Installation Total Cost (with Escalation)
D	*CONSOLE RELATED COSTS*						
D.1	**Console Common Electronics Equipment**				$0.00		$0.00
D.2	**Console Dispatch Position**						
D.2.1	High Tier		5		$0.00		$0.00
D.2.2	Mid Tier				$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)		4		$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)		1		$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.4	**Console Dispatch Accessories**						
D.4.1	Transmit Foot Switch		5		$0.00		$0.00
D.4.2	Microphone		5		$0.00		$0.00
D.4.3	Headset		5		$0.00		$0.00
D.4.5	Auxiliary Speaker		5		$0.00		$0.00
D.4.6	Mouse		5		$0.00		$0.00
D.4.7	Keyboard		5		$0.00		$0.00
D.4.8	Accessories		5		$0.00		$0.00
D.4.9	Chairs		5		$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals		1		$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dialup Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.6	**Subsystem Integration**						
D.6.1	911/E911				$0.00		$0.00
D.6.2	CAD				$0.00		$0.00
D.6.3	Logging Recorder				$0.00		$0.00
D.6.4	NCIC/State				$0.00		$0.00
D.6.5	Other Existing Equipment (List)				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal				$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.8	**Audio Logging Recorder**						
D.8.1	Purchase Price				$0.00		$0.00
D.8.2	Lease Price				$0.00		$0.00
D.8.3	Playback Unit				$0.00		$0.00
D.8.4	Archive Media				$0.00		$0.00
D.9	**Other Console Related Costs (List)**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity				$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.5	Other				$0.00		$0.00
D.9.6	Other				$0.00		$0.00
D.9.7	Other				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
D.10	**Removals**						
	CONSOLE COST SUB-TOTAL				$0.00		$0.00

CONSOLES - Phase 1

OFFEROR: _____

Military Affairs

COV Owned Pricing Section - CONSOLES - Phase 1

0.00% Applied Escalation Per Centage Rate

0.00% Applied Discount Per Centage Rate

CONSOLE GRAND TOTAL $0.00

with DISCOUNT

TOTAL CONSOLE COSTS

			Equipment	Installation
			$0.00	$0.00
			$0.00	$0.00

Item Number	Item Name	Notes Ref #	Number Required	Unit Cost	Equipment Total Cost (with Escalation)	Unit Cost	Installation Total Cost (with Escalation)
D	*CONSOLE RELATED COSTS*						
D.1	**Console Common Electronics Equipment**				$0.00		$0.00
D.2	**Console Dispatch Position**						
D.2.1	High Tier				$0.00		$0.00
D.2.2	Mid Tier		1		$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)				$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)				$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.4	**Console Dispatch Accessories**						
D.4.1	Transmit Foot Switch		1		$0.00		$0.00
D.4.2	Microphone		1		$0.00		$0.00
D.4.3	Headset		1		$0.00		$0.00
D.4.5	Auxiliary Speaker		1		$0.00		$0.00
D.4.6	Mouse		1		$0.00		$0.00
D.4.7	Keyboard		1		$0.00		$0.00
D.4.8	Accessories		1		$0.00		$0.00
D.4.9	Chairs		2		$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals				$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dial-up Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.6	**Subsystem Integration**						
D.6.1	911/E911		1		$0.00		$0.00
D.6.2	CAD		1		$0.00		$0.00
D.6.3	Logging Recorder		1		$0.00		$0.00
D.6.4	NCIC/State		1		$0.00		$0.00
D.6.5	Other Existing Equipment (List)				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal		1		$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.8	**Audio Logging Recorder**						
D.8.1	Purchase Price		1		$0.00		$0.00
D.8.2	Lease Price				$0.00		$0.00
D.8.3	Playback Unit		1		$0.00		$0.00
D.8.4	Archive Media		1		$0.00		$0.00
D.9	**Other Console Related Costs (List)**						
D.9.1	UPS		1		$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity		1		$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.5	Other				$0.00		$0.00
D.9.6	Other				$0.00		$0.00
D.9.7	Other				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
D.10	**Removals**						$0.00
	CONSOLE COST SUB-TOTAL				**$0.00**		**$0.00**

CONSOLES - Phase 1

OFFEROR: _____

State Police

COV Owned Pricing Section - CONSOLES - Phase 1

CONSOLE GRAND TOTAL with DISCOUNT: $0.00

TOTAL CONSOLE COSTS

0.00% Applied Escalation Per Carriage Rate

0.00% Applied Discount Per Carriage Rate

Equipment: $0.00 / $0.00

Installation: $0.00 / $0.00

Item Number	Item Name	Notes Ref#	Number Required	Unit Cost	Equipment Total Cost (with Escalation)	Unit Cost	Installation Total Cost (with Escalation)
D	*CONSOLE RELATED COSTS*		1		$0.00		$0.00
D.1	**Console Common Electronics Equipment**						
D.2	**Console Dispatch Position**						
D.2.1	High Tier		12		$0.00		$0.00
D.2.2	Mid Tier				$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)		11		$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)		1		$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.4	**Console Dispatch Accessories**						
D.4.1	Transmit Foot Switch		12		$0.00		$0.00
D.4.2	Microphone		12		$0.00		$0.00
D.4.3	Headset		12		$0.00		$0.00
D.4.5	Auxiliary Speaker		12		$0.00		$0.00
D.4.6	Mouse		12		$0.00		$0.00
D.4.7	Keyboard		12		$0.00		$0.00
D.4.8	Accessories		12		$0.00		$0.00
D.4.9	Chairs		12		$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals		1		$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dialup Terminals				$0.00		$0.00
D.5.4	System Management Connectivity		1		$0.00		$0.00
D.6	**Subsystem Integration**						
D.6.1	911/E911		1		$0.00		$0.00
D.6.2	CAD		1		$0.00		$0.00
D.6.3	Logging Recorder		1		$0.00		$0.00
D.6.4	NCIC/Stak		1		$0.00		$0.00
D.6.5	Other Existing Equipment (List)				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal		1		$0.00		$0.00
D.7.2	Connectivity Equipment		1		$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.8	**Audio Logging Recorder**						
D.8.1	Purchase Price				$0.00		$0.00
D.8.2	Lease Price				$0.00		$0.00
D.8.3	Playback Unit				$0.00		$0.00
D.8.4	Archive Media				$0.00		$0.00
D.9	**Other Console Related Costs (List)**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity		1		$0.00		$0.00
D.9.4	Aux I/O Expansion		1		$0.00		$0.00
D.9.5	Other				$0.00		$0.00
D.9.6	Other				$0.00		$0.00
D.9.7	Other				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
D.10	**Removals**		3		$0.00		$0.00
	CONSOLE COST SUB-TOTAL				$0.00		$0.00

CONSOLES - Phase 2

OFFEROR: _____

Military Affairs

COV Owned Pricing Section - CONSOLES - Phase 2

CONSOLE GRAND TOTAL $0.00

with DISCOUNT

TOTAL CONSOLE COSTS

Equipment $0.00 $0.00

Installation $0.00 $0.00

0.00% Applied Escalation Per Centage Rate

0.00% Applied Discount Per Centage Rate

Item Number	Item Name	Notes Ref #	Number Required	Unit Cost	Equipment Total Cost (with Escalation)	Unit Cost	Installation Total Cost (with Escalation)
D	*CONSOLE RELATED COSTS*				$0.00		$0.00
D.1	**Console Common Electronics Equipment**						
D.2	**Console Dispatch Position**						
D.2.1	High Tier				$0.00		$0.00
D.2.2	Mid Tier				$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)				$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)				$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.4	**Console Dispatch Accessories**						
D.4.1	Transmit Foot Switch				$0.00		$0.00
D.4.2	Microphone				$0.00		$0.00
D.4.3	Headset				$0.00		$0.00
D.4.5	Auxiliary Speaker				$0.00		$0.00
D.4.6	Mouse				$0.00		$0.00
D.4.7	Keyboard				$0.00		$0.00
D.4.8	Accessories				$0.00		$0.00
D.4.9	Chairs				$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals				$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dialup Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.6	**Subsystem Integration**						
D.6.1	911/E911				$0.00		$0.00
D.6.2	CAD				$0.00		$0.00
D.6.3	Logging Recorder				$0.00		$0.00
D.6.4	NCIC/State				$0.00		$0.00
D.6.5	Other Existing Equipment (List)				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal				$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.8	**Audio Logging Recorder**						
D.8.1	Purchase Price				$0.00		$0.00
D.8.2	Lease Price				$0.00		$0.00
D.8.3	Playback Unit				$0.00		$0.00
D.8.4	Archive Media				$0.00		$0.00
D.9	**Other Console Related Costs (List)**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity				$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.5	Other				$0.00		$0.00
D.9.6	Other				$0.00		$0.00
D.9.7	Other				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
D.10	**Renewals**				$0.00		$0.00
	CONSOLE COST SUB-TOTAL				**$0.00**		**$0.00**

General Input
OFFEROR:

OPTIONAL EQUIPMENT and SERVICES

COV Owned Pricing Section - General Input

Ref #	Specification Ref # SPECIFICATION PARAGRAPH	OPTIONAL REQUIREMENT	Notes Ref #	COV Comment	Option Cost
1	49.6	One year hardware SI maintenance contracts for each LMR, Microwave, and Intranet component not directly manufactured by any member of the SI. COV desires that these maintenance contracts take effect immediately following the expiration of the warranty period.		Per Phase / Per Year	
2	49.6	One year hardware SI maintenance contracts for each Mobile Data component not directly manufactured by any member of the SI. COV desires that these maintenance contracts take effect immediately following the expiration of the warranty period.		Per Phase / Per Year	
3	49.6	Maintenance contract for the system fixed equipment and non-fixed equipment, that maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis		Per Year	
4	49.7	Software maintenance contract to take effect immediately following the expiration of the warranty period, and to be renewable on a yearly basis.		Per Year	
5	49.7	Software support package that provides periodic non-corrective upgrade that enhance the proposed software package.		Initial Proposal	
6	49.9	At the end of each project phase warranty or maintenance period the full complement of applicable spares be delivered to the COV in a repaired condition.		Initial Proposal	
7	4.12.3	All training be conducted in Richmond.		Per Unit	
8	4.18.4	Intranet based solution to facilitate processing the User Evaluation Forms		Systemwide	
9	6.3.1.12	Provide a means for inserting new encryption keys over-the-air, in order to eliminate the requirement for users to come to a central point whenever a new key is issued.		Per Unit	
10	6.3.9.1	APCO Project 25 interface for the Federal Law Enforcement Wireless Users Group (FLEWUG)		Initial Proposal	
11	6.3.1.2	Implementation and use of an AVL system.		Per Unit/ Systemwide	
12	6.3.1.5	Spare parts, training, test fixtures, and special test equipment needed outfit 29 maintenance and service vehicles, 4 tower maintenance vehicles, 3 equipment installation crews, 8 regional service sections and a Richmond depot center. For the dispersed sites, 3 fixed equipment, 10 mobile equipment and 3 Board level fixed equipment test equipment packages are required by the COV.		Initial Proposal	
13	6.2.1.6	Equipment: Per-unit cost for forty (40) installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a truck-mount mobile radio		Per Unit	
14	6.3.1.6	Installation: Per-unit cost for forty (40) installed aeronautical radios capable of operating into the high capacity VHF voice LMR system with all the features and capabilities of a truck-mount mobile radio		Per Unit	
15	6.4.4	Both models should include an option for operation in a digital, encrypted mode. This voice encryption option will be internal to the radio		Per Unit	
16	6.4.5	A version of the control head should be available to control up to three additional conventional radios.		Per Unit	
17	6.4.7	Portable Radio Unit: optional battery pack (slim shell) that allows the use of readily available batteries (e.g. AAA) with a minimum of six hour operational life		Per Unit	
18	6.4.7	Portable Radio Unit: optional speaker-microphone kit, and a concealment kit for covert operation.		Per Unit	
19	6.4.7.1	Portable Radio Unit (all bands): operation in a digitally encrypted (AES) mode. This voice encryption option will be internal to the radio.		Per Unit	
20	6.4.12.1	Other mounting configurations for Control Stations (Rack and Wall)		Per Unit	
21	6.4.14.2	Increase the channel name capability to 1000.		Per Console	

INSERT
OFFEROR: _____

Emergency Management

PARTNERSHIP PRICING SPEADSHEET - SUBSCRIBER CHARGES, PER AGENCY

Item Number	Item Name	Notes Ref #	Number of Units	Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
			Total Charges		**Monthly $0.00**		**Annual $0.00**
				LMR Units	$0.00		$0.00
				Console Units	$0.00		$0.00
				MCT Units	$0.00		$0.00
				Intranet	$0.00		$0.00
E.7	**Legal Speaker/Mic/Antenna**						
E.7.1	Analog Speaker/Mic/Antenna				$0.00		$0.00
E.7.2	Digital Speaker/Mic/Antenna				$0.00		$0.00
E.7.3	Intrinsic Speaker/Mic/Antenna				$0.00		$0.00
E.8	**Control Station - Local Control**						
E.8.1	Command		14		$0.00		$0.00
E.8.3	Skill		40		$0.00		$0.00
E.8.5	Analog				$0.00		$0.00
E.8.11	Other				$0.00		$0.00
E.9	**Remote Control Units**						
E.9.1	Command				$0.00		$0.00
E.9.3	Skill				$0.00		$0.00
E.9.5	Analog				$0.00		$0.00
E.9.10	Other				$0.00		$0.00
E.9.11	Other				$0.00		$0.00
E.10	**Cryptographic Keyloader**				$0.00		$0.00
E.11	**Over The Air Programming**				$0.00		$0.00
E.12	**Other Radio Related Charges**						
E.12.1	Other				$0.00		$0.00
E.12.2	Other				$0.00		$0.00
	SUBSCRIBER RADIO CHARGES SUB-TOTAL				**$0.00**		**$0.00**
D	*CONSOLE RELATED CHARGES*						
D.2	**Console Dispatch Position**						
D.2.1	High Tier		5		$0.00		$0.00
D.2.2	Mid Tier				$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)		4		$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)		1		$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals				$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dialog Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal				$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.9	**Other Console Related Charges**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity				$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
	CONSOLE CHARGES SUB-TOTAL				**$0.00**		**$0.00**

INSERT OFFEROR: _____

Marine Resources

PARTNERSHIP PRICING SPEADSHEET - SUBSCRIBER CHARGES, PER AGENCY

Item Number	Item Name	Notes Ref #	Number of Units	Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
			Total Charges		Monthly $0.00		Annual $0.00
			LMR Units		$0.00		$0.00
			Console Units		$0.00		$0.00
			MCT Units		$0.00		$0.00
			Intranet		$0.00		$0.00
I	*MOBILE COMPUTING/TERMINAL CHARGES*						
I.1	Data Modem				$0.00		$0.00
I.2	Mobile Computing Radio Units				$0.00		$0.00
I.3	Standard Mobile Radio Antenna		80		$0.00		$0.00
I.4	Standard MCT w/mount		15		$0.00		$0.00
I.5	Rugged MCT w/mount				$0.00		$0.00
I.6	Vehicle located Printer				$0.00		$0.00
I.7	External 3.5" Disk Drive				$0.00		$0.00
I.8	MCT memory loading Equipment				$0.00		$0.00
I.9	Other				$0.00		$0.00
	SUBSCRIBER MOBILE COMPUTER CHARGES SUB-TOTAL				$0.00		$0.00
J.	*INTRANET*						
J.1	T-1/DS-1 Hub/Router				$0.00		$0.00
J.2	Firewall				$0.00		$0.00
J.3	Software Setup				$0.00		$0.00
J.4	Wiring/Cabling				$0.00		$0.00
J.5	Servers				$0.00		$0.00
J.6	Network Attached Storage				$0.00		$0.00
J.7	Message Server				$0.00		$0.00
J.8	Message Switch				$0.00		$0.00
J.9	Proxy Server				$0.00		$0.00
J.10	Alarm Equipment				$0.00		$0.00
J.12	Other				$0.00		$0.00
	INTRANET CHARGES SUB-TOTAL				$0.00		$0.00

INSEAT OFFEROR: _____

Military Affairs

PARTNERSHIP PRICING SPEADSHEET - SUBSCRIBER CHARGES, PER AGENCY

Item Number	Item Name	Notes Ref #	Number of Units	Total Charges: Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
					Monthly $0.00		Annual $0.00
				LMR Units	$0.00		$0.00
				Console Units	$0.00		$0.00
				MCT Units	$0.00		$0.00
				Intranet	$0.00		$0.00
E	*SUBSCRIBER RADIO RELATED CHARGES*						
E.1	**Dash Mount Mobile Radios**						
E.11	Command		3		$0.00		$0.00
E.13	Staff		12		$0.00		$0.00
E.15	Marine Command				$0.00		$0.00
E.15	Marine Staff				$0.00		$0.00
E.17	Aircraft Command				$0.00		$0.00
E.18	Aircraft Staff				$0.00		$0.00
E.19	Analog				$0.00		$0.00
E.112	Other				$0.00		$0.00
E.2	**Trunk Mount Mobile Radios**						
E.21	Command				$0.00		$0.00
E.23	Staff				$0.00		$0.00
E.25	Marine Command				$0.00		$0.00
E.25	Marine Staff				$0.00		$0.00
E.27	Aircraft Command				$0.00		$0.00
E.28	Aircraft Staff				$0.00		$0.00
E.29	Motorcycle Command				$0.00		$0.00
E.210	Motorcycle Staff				$0.00		$0.00
E.211	Analog				$0.00		$0.00
E.212	Motorcycle Helmet accessories				$0.00		$0.00
E.213	Noise attenuating headset				$0.00		$0.00
E.3	**Portable Radios**						
E.31	Command		15		$0.00		$0.00
E.33	Staff		55		$0.00		$0.00
E.35	Analog				$0.00		$0.00
E.35	Intrinsic Command				$0.00		$0.00
E.37	Intrinsic Staff				$0.00		$0.00
E.38	Concealable				$0.00		$0.00
E.39	Command & Staff Battery				$0.00		$0.00
E.310	Command & Staff intrinsic Battery				$0.00		$0.00
E.311	Analog Battery				$0.00		$0.00
E.312	Concealable Battery				$0.00		$0.00
E.323	Other				$0.00		$0.00
E.324	Other				$0.00		$0.00
E.4	**Vehicular Repeater Units**						
E.41	Command Repeater Unit				$0.00		$0.00
E.42	Staff Repeater Unit				$0.00		$0.00
E.44	Portable Radio Unit				$0.00		$0.00
E.47	Other				$0.00		$0.00
E.5	**Multi Charger Units**						
E.51	Command & Staff Multi-Charge- Unit				$0.00		$0.00
E.52	Analog Multi-Charger Unit				$0.00		$0.00
E.53	Concealable Multi-Charger Unit				$0.00		$0.00
E.54	Wall Mount Adapter				$0.00		$0.00
E.55	Other				$0.00		$0.00
E.6	**Battery Analyzer**				$0.00		$0.00

INSEAT
OFFEROR: _____

Military Affairs

PARTNERSHIP PRICING SPEADSHEET - SUBSCRIBER CHARGES, PER AGENCY

		Monthly	Annual
	Total Charges	**$0.00**	**$0.00**
	LMR Units	$0.00	$0.00
	Console Units	$0.00	$0.00
	MCT Units	$0.00	$0.00
	Intranet	$0.00	$0.00

Item Number	Item Name	Notes Ref #	Number of Units	Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
E.7	**Lapel Speaker/Mic/Antenna**						
E.7.1	Analog Speaker/Mic/Antenna				$0.00		$0.00
E.7.2	Digital Speaker/Mic/Antenna				$0.00		$0.00
E.7.3	Intrinsic Speaker/Mic/Antenna				$0.00		$0.00
E.8	**Control Station - Local Control**						
E.8.1	Command		6		$0.00		$0.00
E.8.3	Staff				$0.00		$0.00
E.8.5	Analog				$0.00		$0.00
E.8.11	Other				$0.00		$0.00
E.9	**Remote Control, Units**						
E.9.1	Command				$0.00		$0.00
E.9.3	Staff				$0.00		$0.00
E.9.5	Analog				$0.00		$0.00
E.9.10	Other				$0.00		$0.00
E.9.11	Other				$0.00		$0.00
E.10	**Cryptographic Keyloader**				$0.00		$0.00
E.11	**Over The Air Programming**				$0.00		$0.00
E.12	**Other Radio Related Charges**						
E.12.1	Other				$0.00		$0.00
E.12.2	Other				$0.00		$0.00
	SUBSCRIBER RADIO CHARGES SUB-TOTAL				**$0.00**		**$0.00**
D	*CONSOLE RELATED CHARGES*						
D.2	**Console Dispatch Position**						
D.2.1	High Tier				$0.00		$0.00
D.2.2	Mid Tier		1		$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ADA Compliant)				$0.00		$0.00
D.3.2	Supervisor (ADA Compliant)				$0.00		$0.00
D.3.3	Training (ADA Compliant)				$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals				$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dial-up Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal				$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.9	**Other Console Related Charges**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity				$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
	CONSOLE CHARGES SUB-TOTAL				**$0.00**		**$0.00**

INSERT OFFEROR: _____

Military Affairs

PARTNERSHIP PRICING SPEADSHEET - SUBSCRIBER CHARGES, PER AGENCY

Item Number	Item Name	Notes Ref #	Number of Units	Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
				Total Charges	Monthly $0.00		Annual $0.00
				LMR Units	$0.00		$0.00
				Console Units	$0.00		$0.00
				MCT Units	$0.00		$0.00
				Intranet	$0.00		$0.00
I.	*MOBILE COMPUTING TERMINAL CHARGES*						
I.1	Data Modem		4		$0.00		$0.00
I.2	Mobile Computing Radio Units		4		$0.00		$0.00
I.3	Standard Mobile Radio Antenna		4		$0.00		$0.00
I.4	Standard MCT w/mount				$0.00		$0.00
I.5	Rugged MCT w/mount		4		$0.00		$0.00
I.6	Vehicle located Printer		4		$0.00		$0.00
I.7	External 3.5" Disk Drive		4		$0.00		$0.00
I.8	MCT memory leading Equipment		4		$0.00		$0.00
I.9	Other		1		$0.00		$0.00
	SUBSCRIBER MOBILE COMPUTER CHARGES SUB-TOTAL				$0.00		$0.00
J.	*INTRANET*						
J.1	T-1/DS-1 Hub /Router				$0.00		$0.00
J.2	Firewall				$0.00		$0.00
J.3	Software Setup				$0.00		$0.00
J.4	Wiring/Cabling				$0.00		$0.00
J.5	Servers				$0.00		$0.00
J.6	Network Attached Storage				$0.00		$0.00
J.7	Message Server				$0.00		$0.00
J.8	Message Switch				$0.00		$0.00
J.9	Proxy Server				$0.00		$0.00
J.10	Alarm Equipment				$0.00		$0.00
J.12	Other				$0.00		$0.00
	INTRANET CHARGES SUB-TOTAL				$0.00		$0.00

INSERT OFFEROR: _____

State Police

PARTNERSHIP PRICING SPREADSHEET - SUBSCRIBER CHARGES, PER AGENCY

Item Number	Item Name	Notes Ref #	Number of Units	Total Charges: Monthly Unit Charges	Total Monthly Charges	Annual Unit Charges	Total Annual Cost
					Monthly $0.00		Annual $0.00
				LMR Units	$0.00		$0.00
				Console Units	$0.00		$0.00
				MCT Units	$0.00		$0.00
				Intranet	$0.00		$0.00
E.7	**Lapel Speaker/Mic/Antenna**						
E.7.1	Analog Speaker/Mic/Antenna				$0.00		$0.00
E.7.2	Digital Speaker/Mic/Antenna				$0.00		$0.00
E.7.3	Intrinsic Speaker/Mic/Antenna				$0.00		$0.00
E.8	**Control Station - Local Control**						
E.8.1	Command		14		$0.00		$0.00
E.8.3	Staff		42		$0.00		$0.00
E.8.5	Analog				$0.00		$0.00
E.8.11	Other				$0.00		$0.00
E.9	**Remote Control Units**						
E.9.1	Command				$0.00		$0.00
E.9.3	Staff				$0.00		$0.00
E.9.5	Analog				$0.00		$0.00
E.9.10	Other				$0.00		$0.00
E.9.11	Other				$0.00		$0.00
E.10	**Cryptographic Keyloader**				$0.00		$0.00
E.11	**Over The Air Programming**				$0.00		$0.00
E.12	**Other Radio Related Charges**						
E.12.1	Other				$0.00		$0.00
E.12.2	Other				$0.00		$0.00
	SUBSCRIBER RADIO CHARGES SUB-TOTAL				**$0.00**		**$0.00**
D	*CONSOLE RELATED CHARGES*						
D.2	**Console Dispatch Position**						
D.2.1	High Tier		60		$0.00		$0.00
D.2.2	Mid Tier				$0.00		$0.00
D.2.3	Basic Tier				$0.00		$0.00
D.3	**Console Dispatch Furniture**						
D.3.1	Operator (ALA Compliant)				$0.00		$0.00
D.3.2	Supervisor (ALA Compliant)				$0.00		$0.00
D.3.3	Training (ALA Compliant)				$0.00		$0.00
D.5	**System Manager and Control System**						
D.5.1	System Manager Terminals				$0.00		$0.00
D.5.2	Terminals				$0.00		$0.00
D.5.3	Dial-up Terminals				$0.00		$0.00
D.5.4	System Management Connectivity				$0.00		$0.00
D.7	**Alarms**						
D.7.1	Terminal				$0.00		$0.00
D.7.2	Connectivity Equipment				$0.00		$0.00
D.7.3	Other				$0.00		$0.00
D.9	**Other Console Related Charges**						
D.9.1	UPS				$0.00		$0.00
D.9.2	AVL Connectivity				$0.00		$0.00
D.9.3	T-1 Connectivity				$0.00		$0.00
D.9.4	Aux I/O Expansion				$0.00		$0.00
D.9.8	Other				$0.00		$0.00
D.9.9	Other				$0.00		$0.00
	CONSOLE CHARGES SUB-TOTAL				**$0.00**		**$0.00**

TABLE B-1
EXISTING SITES

Site No.	Site Name	Agency	Site Type	Site Address	County/City Site Location	Owned/Leased*
1101	State Police Headquarters	VSP	LMR and Microwave	7700 Midlothian Turnpike, Richmond, VA 23235	Chesterfield	O
1102	1st Division Headquarters	VSP	Dispatch and Microwave	9300 Brook Road	Hanover	O
1103	Petersburg Area Office	VSP	LMR and Microwave	8312 Halifax Road, Petersburg, VA 23801	Dinwiddie	O
1104	West Point Area Office	VSP	Microwave	32303 King William Road-P.O. Box 230, West Point, VA 23181	King William	O
1105	Warsaw Area Office	VSP	LMR and Microwave	State Route 3, Warsaw, VA 22572	Richmond	O
1106	Louisa Area Office	VSP	LMR and Microwave	3707 Cross Country Road, Mineral, VA 23117	Louisa	O
1107	Branches Church	VSP	Microwave-not in use	3601 Iron Bridge Road, Richmond, VA 23234	Chesterfield	O
1108	Powhatan Repeater	VSP	Microwave	1818 Page Road, 2 miles East of Flat Rock, 1 mile North of Route 60 on Page Road (Rt. 675)	Powhatan	O
1109	Burgess Repeater	VSP	LMR and Microwave	Highway 360 between Burgess store AWP Post Office, Fairport, VA 22432	Northumberland	LT
1201	2nd Division Headquarters	VSP	Dispatch, Microwave, LMR	15148 State Police Road, Culpeper, VA 22701	Culpeper	O
1202	Fredericksburg Area Office	VSP	LMR and Microwave	3804 Loren Drive, Fredericksburg, VA 22401	Spotsylvania	O
1203	Warrenton Area Office	VSP	Microwave	224 Box 29, Warrenton, VA, 20186	Fauquier	O
1204	Gordonsville Repeater	VSP	LMR and Microwave	VA Rt 15, 2 mi N of Gordonsville	Orange	O/L
1205	Fork Mountain Repeater	VSP	LMR and Microwave	Fork Mtn, 7 mi W of Madison	Madison	O/L
1206	Highback Mountain Repeater	VSP	LMR and Microwave	Jefferson Natl Park	Warren	O/L
1207	Pinnacle Ridge Repeater	VSP	LMR and Microwave	Pinnacle Ridge, Gore, VA	Frederick	O
1208	Luray Area Office	VSP	Microwave	St. Rt. 616, S of Luray, VA	Page	O
1209	Winchester Area Office	VSP	Microwave	US Rt. 11, 3 mi S of Winchester	Frederick	O
1210	Harrisonburg Area Office	VSP	LMR and Microwave	1.5 mi S of 78/11 S. of Harrisonburg	Rockingham	O
1211	View Tree (Warrenton Training Center)	VSP	LMR and Microwave	US Rt. 17 1 mi N of Warrenton	Warrenton	LT
1301	3rd Division Headquarters	VSP	Dispatch, LMR and MW	US Rt. 460 exit Rt. 613	Appomattox	O
1302	Long Mountain Repeater	VSP	LMR and Microwave	Long Mountain, Rustburg, VA. 24588 (County of Campbell)	Campbell	O/L
1303	South Hill Area Office	VSP	LMR and Microwave	US Rt. 1 (1 mile North of South Hill) South Hill, VA. 23970	Mecklenburg	O
1304	Halifax Repeater	VSP	LMR and Microwave	Intersection Rt. 501 & VA Rt. 610, Halifax, VA. 24558	Halifax	O
1305	Halifax Area Office	VSP	Microwave	355 N Main St, Halifax, VA 24558-0727	Halifax	O
1306	Sprouses Corner Area Office	VSP	LMR and Microwave	US Rt. 60 and US Rt 15 at Sprouses Corner,	Buckingham	O
1307	Cumberland Repeater	VSP	LMR and Microwave	VA Rt 45 (3 mi. west of), Cumberland, VA. 23040	Cumberland	O
1308	Bear Den Mountain Repeater	VSP	LMR and Microwave	Bear Den Mountain, (State Police building off Skyline Drive) Afton, VA. 22920	Augusta	O/L
1310	Staunton Area Office	VSP	Microwave	Rat 250 E. and State Rt. 126, Staunton, VA. 24401	Staunton (city)	O
1401	4th Division Headquarters	VSP	Microwave, Dispatch	Exit 77 off of I-81, 2 mi. E of Wytheville on N side of Frontage Rd., Rt. 336	Wythe	O
1402	Walker Mountain Repeater	VSP	Microwave, LMR	7 mi. N of Wytheville, on Rt. 206, 4 mi. E of Rt. 52	Bland	O/L
1403	Dismal (Flat Top) Mtn. Rptr.	VSP	Microwave, LMR	End of Rt. 663, 10 km S of Narrows	Giles	O/L
1404	Beamer Knob Repeater	VSP	Microwave, LMR	2.75 mi W of Fancy Gap, approx. 1 mi. off of Rt. 775 on Rt. 1099	Carroll	O/L
1405	White Top Mountain Repeater	VSP	Microwave, LMR	White Top Mountain, Smyth County, 2 mi SE of Kamanock	Smyth	O/L
1406	East River Mountain Repeater	VSP	Microwave, LMR	Off Cove Creek Rd. Tazewell County, Virginia (6 mi up mountain)	Tazewell	O/L

TABLE B-1
EXISTING SITES

Site No.	Site Name	Agency	Site Type	Site Address	County/City Site Location	Owned/Leased*
1407	Big A Mountain Repeater	VSP	Microwave, LMR	Fire tower on Big A Mountain, 5 miles NW of Honaker, Virginia	Buchanan	O/L
1408	Claypool Hill Area Office	VSP	Microwave	US Rt. 19, 1 mi. S of intersection with US Rt. 460	Tazewell	O
1409	High Knob Repeater	VSP	Microwave, LMR	4 miles south of Norton	Wise	O
1410	Wise Area Office	VSP	Microwave	1207 Norton Rd., Wise, VA. 24293	Wise	O
1411	Hunter's Gap Repeater	VSP	Microwave, LMR	1 mile west of Rt. 70 on Powell Mountain, Jonesville	Lee	O/L
1412	Bristol Area Office	VSP	Microwave	868 Bonham Rd. Bristol, Virginia 24201	Washington	O
1413	Vansant Area Office	VSP	Microwave	E side of Rt. 83, 2.5 miles S of Vansant	Buchanan	O
1414	Dublin Area Office	VSP	Microwave	5290 Bagging Plant Rd., intersection of Claybourne Blvd. and Bagging Plant Rd.	Pulaski	O
1501	5th Division Headquarters	VSP	Microwave, Dispatch, LMR	1557 South Military Highway, Chesapeake, VA 23327-1067	Chesapeake (city)	O
1502	Hampton Repeater	VSP	Microwave, LMR	4911 Mercury Blvd, Hampton, VA 23605	Hampton (city)	O
1503	Williamsburg Repeater	VSP	Microwave, LMR	147 Fenton Mill Road, Williamsburg, VA 23188	York	O
1504	Waverly Repeater	VSP	Microwave, LMR	Rt. 460, Waverly, VA.	Sussex	O
1505	Emporia Repeater	VSP	Microwave, LMR	2361 Sussex Dr, Emporia, VA 23847	Greensville	O
1506	Franklin Area Office	VSP	Microwave, LMR	30010 Camp Parkway, Courtland, VA 23837	Southampton	O
1507	Suffolk Repeater	VSP	Microwave	2900 Pruden Blvd, Suffolk, VA 23434	Suffolk (city)	O
1508	Melfa Area Office	VSP	Microwave, LMR	27384 Lankford Highway, Melfa, VA 23410	Accomack	O
1509	Eastville Repeater	VSP	Microwave, LMR	Hampton County Landfill ,Cape Charles, VA 23310	Northampton	O/L
1601	6th Division Headquarters	VSP	Microwave, Dispatch	3775 West Main Street, Salem, Virginia, 24153	Roanoke	O
1602	Poor Mountain Repeater	VSP	Microwave, LMR	Poor Mountain 3 miles northwest of Calloway, Virginia	Montgomery	O
1603	Fort Lewis Mountain Repeater	VSP	Microwave, LMR	Fort Lewis Mountain near Big Bear Rock	Roanoke	O/L
1604	Bull Mountain Repeater	VSP	Microwave, LMR	Bull Mountain 3 miles north of Stewart, Virginia	Patrick	O/L
1605	Martinsville Area Office	VSP	Microwave	4200 Greensboro Road, P.O. Box 4586, Martinsville, Virginia 24115	Henry	O
1606	Danville Area Office	VSP	Microwave	121 Maple Wood Street, Danville, VA 24543	Danville (city)	O
1607	White Oak Mountain Repeater	VSP	Microwave, LMR	Off of Highway US 29, 541 Tower lane (RT 1032), Danville, VA	Pittsylvania	L/T
1608	Bedford Area Office	VSP	Microwave	874 Blue Ridge Avenue Bedford, VA 24523	Bedford	O
1609	North Mountain Repeater	VSP	Microwave, LMR	North Mountain 20 miles west of Lexington, Virginia	Alleghany	O/L
1610	Lexington Area Office	VSP	Microwave	3861 South Lee Highway, Natural Bridge, VA 24578	Rockbridge	O
1611	Clifton Forge Area Office	VSP	Microwave	1714 Main Street, Clifton Forge, Virginia	Alleghany	O
1612	Duncan Knob Repeater	VSP	Microwave, LMR	Duncan Knob 10 miles north of Warm Springs, Virginia	Bath	O/L
1613	Sounding Knob Repeater	VSP	Microwave, LMR	Sounding Knob, Jack Mountain, southeast of Monterey, Virginia	Highland	O/L
1614	Greens Knob	VSP	Microwave	Rt. 635, 1.5 miles north of Rt. 619, Stewartsville, Virginia	Bedford	O/L
1701	7th Division Headquarters	VSP	Microwave, Dispatch, LMR	9801 Braddock Rd, Fairfax, VA 22039	Fairfax	O
1702	Independent Hill Area Office	VSP	Microwave, LMR	14420 Dumfries Rd., Manassas, VA, 22110	Prince William	O
1703	Columbia Pike Repeater	VSP	Microwave, LMR	1426A Columbia Pike, Arlington, VA 22048	Arlington (city)	O/L
1704	Quantico Marine Base	VSP	LMR, Microwave	2117 McCarrack Road, Quantico Marine Base, VA	Prince William	L/T
2101	Richmond District Shop	VDOT	Microwave	2400 Pine Forest Drive, Colonial Heights, VA 23834	(city)	O/V
2102	Fulton Depot	VDOT	Microwave	505 Bickerstaff Rd., Richmond, VA 23231	Richmond (city)	O/V
2103	Central Office	VDOT	Microwave	1221 East Broad Street	Richmond (city)	O/V

TABLE B-1
EXISITNG SITES

Site No.	Site Name	Agency	Site Type	Site Address	County/City Site Location	Owned/Leased*
2201	Falmouth	VDOT	Microwave	87 Deacon Road, Fredericksburg, VA, 22405	Stafford	O/V
2202	Culpeper	VDOT	Microwave	1601 Orange St (RT 15), Culpeper, VA, 22701	Culpeper	O/V
2203	Massanutten Mountain	VDOT	LMR	Big Mountain Road, Massanutten, VA., 22840	Rockingham	O/V
2301	Lynchburg	VDOT	Microwave	4319 Campbell Ave, Lynchburg, VA 24502	Campbell	O/V
2401	Wytheville VDOT	VDOT	Microwave	U.S. Rt. 11, 1.2 mi W of Wytheville	Wythe	O/V
2402	Tazewell VDOT	VDOT	Microwave	Rt. 61, 0.2 mi N of the intersecion of Rts 19 and 460	Tazewell	O/V
2403	Dial Rock VDOT	VDOT	Microwave	Dial Rock Road, Tazewell	Tazewell	O/V
2404	Wise Residency VDOT	VDOT	Microwave	703 Hurricane Rd., NE, Wise	Wise	O/V
2405	Jonesville Residency VDOT	VDOT	Microwave	US Rt. 58, 1 mile west of Jonesville	Lee	O/V
2406	Lebanon VDOT	VDOT	Microwave	Rt. 71, Lebanon, VA. 24266	Russell	O/V
2501	Suffolk	VDOT	Microwave	1700 North Main Street, Suffolk, VA 23434	Suffolk (city)	O/V
2601	Salem Shop VDOT	VDOT	Microwave	731 Harrison Street, Salem, VA 24153	Salem (city)	O/V
2602	Salem Area VDOT HQ	VDOT	Microwave	714 S Broad Street, Salem, VA 24153	Salem (city)	O/V
2603	Chatham VDOT	VDOT	Microwave	19281 U.S. Hwy 29, Chatham, VA, 24531	Pittsylvania	O/V
T1	Big Walker Mountain Tunnel	N/A	LMR	I-77	N/A	
T2	Hampton Roads Tunnel	N/A	LMR	I-64	N/A	
T3	Elizabeth River Downtown Tunnel	N/A	LMR	I-264	N/A	
T4	[illegible]	N/A	LMR	I-664	N/A	
T5	Chesapeak Bay Bridge Tunnel (North)	N/A	LMR	US RT-13	N/A	
T6	Chesapeak Bay Bridge Tunnel (South)	N/A	LMR	US RT-13	N/A	
T7	Elizabeth River Midtown Tunnel	N/A	LMR	US RT 58/337	N/A	
T8	East River Mountain Tunnel	N/A	LMR	I-77	N/A	
x						
L/T	Leased Tower					
O/L	Owned Towers on Leased Land					
O	Towers Owned by VSP					
O/V	Towers Owned by VDOT					

TABLE E-1
STARS SUBSCRIBER UNIT COUNTS

COV AGENCY	Mobile Radios by Tier			5-Year Growth	10-Year Growth	Total Portable	Initial Encrypted
	Command	Staff	Initial Total	Initial Total	Initial Total	Quantities	Mobiles
Alcoholic Beverage Control	165	0	165	174	182	0	0
Dept. of Aviation +	1	3	4	5	5	0	0
Capitol Police	7	15	22	24	25	100	7
Dept. of Conservation & Recreation	6	148	154	162	170	248	72
Dept. of Corrections	80	240	320	340	380	208	0
Dept. of Emergency Management **	15	18	33	35	37	65	33
Dept. of Environmental Quality	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	13	0
Dept. of Forestry +	51	559	610	641	671	364	0
Dept. of Game & Inland Fisheries +, +++	74	367	441	464	486	312	279
Dept. of Health –++	6	12	18	19	20	0	0
Dept. of Information Technology	1	0	1	2	2	20	0
Dept. of Juvenile Justice	5	40	45	48	50	106	3
Marine Resources Commission +, +++	45	123	168	177	185	79	33
Dept. of Military Affairs *, +	3	14	17	18	19	70	3
Dept. of Mines, Minerals & Energy	38	112	150	158	165	4	0
Dept. of Motor Vehicles	10	89	99	125	150	70	12
State Police +, ++	774	2333	3107	3263	3418	404	929
Dept. of Transportation	1000	4000	5000	5250	5500	830	0
Federal Agencies	59	178	237	249	261	0	72
TOTALS	2340	8251	10591	11154	11726	2893	1443

NOTES:

1. * - 5 Mobile staff radios are for Blackhawk Helicopters
2. Mobile radio counts include the following:
   - \+ 28 Aircraft radios
   - ++ 35 Motorcycle radios
   - +++ 146 Boat radios
3. ** - Portable radio counts include 20 Intrinsically Safe radios

TABLE E-1
STARS SUBSCRIBER UNIT COUNTS

COV AGENCY	Portable Radios by Tier			5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Portables
	Command	Staff	Initial Total			
Alcoholic Beverage Control	0	0	0	0	0	0
Dept. of Aviation +	0	0	0	0	0	0
Capitol Police	23	77	100	105	110	30
Dept. of Conservation & Recreation	12	236	248	261	273	0
Dept. of Corrections	52	156	208	216	224	0
Dept. of Emergency Management **	20	45	65	69	72	53
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	13	13	14	15	0
Dept. of Forestry +	10	354	364	383	401	0
Dept. of Game & Inland Fisheries +, +++	79	233	312	328	344	94
Dept. of Health +++	0	0	0	0	0	0
Dept. of Information Technology	2	18	20	21	22	0
Dept. of Juvenile Justice	26	80	106	112	117	0
Marine Resources Commission +, +++	20	59	79	83	87	24
Dept. of Military Affairs *, +	15	55	70	74	77	21
Dept. of Mines, Minerals & Energy	1	3	4	5	5	0
Dept. of Motor Vehicles	10	60	70	87	105	12
State Police +, ++	101	303	404	425	445	122
Dept. of Transportation	80	750	830	872	913	0
Federal Agencies	0	0	0	0	0	0
TOTALS	451	2442	2893	3055	3210	356

TABLE E-1
STARS SUBSCRIBER UNIT COUNTS

COV AGENCY	Control Stations by Tier			5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted C. Stations
	Command	Staff	Initial Total			
Alcoholic Beverage Control	0	0	0	0	0	0
Dept. of Aviation +	0	0	0	0	0	0
Capitol Police	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	31	31	33	35	31
Dept. of Corrections	12	40	52	87	90	0
Dept. of Emergency Management **	14	40	54	57	60	3
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry +	0	12	12	13	14	0
Dept. of Game & Inland Fisheries +, +++	6	0	6	7	7	6
Dept. of Health +++	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	2	7	9	10	10	3
Marine Resources Commission +, +++	0	1	1	2	2	1
Dept. of Military Affairs *, +	6	0	6	7	7	2
Dept. of Mines, Minerals & Energy	0	1	1	2	2	0
Dept. of Motor Vehicles	0	12	12	13	14	0
State Police +, ++	14	42	56	59	62	17
Dept. of Transportation	60	290	350	368	385	0
Federal Agencies	0	0	0	0	0	0
TOTALS	114	476	590	658	688	63

TABLE E-1
STARS SUBSCRIBER UNIT COUNTS

COV AGENCY	Consoles by Tier			Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total
	High	Medium	Basic			
Alcoholic Beverage Control	0	0	0	0	0	0
Dept. of Aviation +	0	0	0	0	0	0
Capitol Police	2	0	0	2	3	3
Dept. of Conservation & Recreation	0	0	0	0	0	0
Dept. of Corrections	0	0	0	0	0	0
Dept. of Emergency Management **	4	0	0	4	5	5
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry +	4	0	0	4	17	27
Dept. of Game & Inland Fisheries +, +++	0	1	0	1	2	2
Dept. of Health +++	1	0	0	1	2	2
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0
Marine Resources Commission +, +++	1	0	0	1	2	2
Dept. of Military Affairs *, +	0	1	0	1	2	2
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	0	0	0
State Police +, ++	56	0	0	56	59	62
Dept. of Transportation	2	0	0	2	6	6
Federal Agencies	0	0	0	0	0	0
TOTALS	70	2	0	72	98	111

TABLE E-1
STARS SUBSCRIBER UNIT COUNTS

COV AGENCY	Vehicular Repeaters Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	MCTs by Tier			5 Year Growth Initial Total	10-Year Growth Initial Total
				Rugged	Standard	Initial Total		
Alcoholic Beverage Control	0	0	0	0	0	0	0	0
Dept. of Aviation +	0	0	0	0	0	0	0	0
Capitol Police	0	0	0	2	16	18	20	25
Dept. of Conservation & Recreation	72	76	80	80	0	80	84	88
Dept. of Corrections	0	0	0	0	0	0	0	0
Dept. of Emergency Management **	0	0	0	30	0	30	32	33
Dept. of Environmental Quality	0	0	0	0	15	15	16	17
Dept. of Fire Programs	0	0	0	0	0	0	0	0
Dept. of Forestry +	12	13	14	0	14	14	15	16
Dept. of Game & Inland Fisheries +, +++	200	210	220	200	0	200	210	220
Dept. of Health +++	0	0	0	0	10	10	11	11
Dept. of Information Technology	0	0	0	1	7	8	9	9
Dept. of Juvenile Justice	0	0	0	1	8	9	10	10
Marine Resources Commission +, +++	70	74	77	15	80	95	100	105
Dept. of Military Affairs *, +	0	0	0	4	0	4	5	5
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	60	0	60	75	90
State Police +, ++	1319	1385	1451	1353	150	1503	1579	1654
Dept. of Transportation	750	788	825	260	0	260	273	286
Federal Agencies	0	0	0	0	0	0	0	0
TOTALS	**2423**	**2546**	**2667**	**2006**	**300**	**2306**	**2439**	**2569**

TABLE E1-A
STARS SUBSCRIBER UNIT COUNTS - PHASE I

COV AGENCY	Total Mobile Quantities	Mobile Radios by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Mobiles
		Command	Staff				
Alcoholic Beverage Control*	28	28	0	28	30	31	0
Dept. of Aviation	4	1	3	4	5	5	0
Capitol Police*	22	7	15	22	24	25	3
Dept. of Conservation & Recreation	29	1	28	29	31	32	18
Dept. of Corrections	74	19	55	74	78	82	0
Dept. of Emergency Management	11	5	6	11	12	13	0
Dept. of Environmental Quality	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0	0
Dept. of Forestry	133	11	122	133	140	147	0
Dept. of Game & Inland Fisheries*	88	15	73	88	93	97	70
Dept. of Health	2	1	1	2	3	3	0
Dept. of Information Technology	1	1	0	1	2	2	0
Dept. of Juvenile Justice	43	4	39	43	46	48	1
Marine Resources Commission*	35	9	26	35	37	39	5
Dept. of Military Affairs*	17	3	14	17	18	19	1
Dept. of Mines, Minerals & Energy	2	1	1	2	3	3	0
Dept. of Motor Vehicles	28	7	21	28	30	31	0
State Police*	779	192	587	779	818	857	58
Dept. of Transportation	953	191	762	953	1001	1049	0
Federal Agencies*	55	14	41	55	58	61	5
TOTALS	2304	510	1794	2304	2429	2544	161

NOTES:
1. Console quantities derived from COV Needs Assessment Report, Rev. 1, dated March 14, 2001
2. * - Agencies requiring encrypted radios for their operations

TABLE E1-A
STARS SUBSCRIBER UNIT COUNTS - PHASE I

COV AGENCY	Total Portable Quantities	Portable Radios by Tier			5-Year Growth Initial Total	10-Year Growth Initial Total	Total C. Station Quantities	Initial Encrypted Portables
		Command	Staff	Initial Total				
Alcoholic Beverage Control*	0	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0	0
Capitol Police*	100	23	77	100	105	110	0	30
Dept. of Conservation & Recreation	46	2	26	28	30	31	5	0
Dept. of Corrections	42	11	31	42	45	47	9	0
Dept. of Emergency Management	44	14	30	44	47	49	2	0
Dept. of Environmental Quality	0	0	0	0	0	0	0	0
Dept. of Fire Programs	13	0	13	13	14	15	0	0
Dept. of Forestry	68	2	63	65	69	72	3	0
Dept. of Game & Inland Fisheries*	49	0	0	0	0	0	1	0
Dept. of Health	0	0	0	0	0	0	0	0
Dept. of Information Technology	20	2	18	20	21	22	0	0
Dept. of Juvenile Justice	80	20	60	80	84	88	6	0
Marine Resources Commission*	15	0	0	0	0	0	0	0
Dept. of Military Affairs*	40	11	29	40	42	44	3	12
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	15	4	11	15	16	17	3	0
State Police*	55	14	41	55	58	61	8	17
Dept. of Transportation	153	15	0	15	16	17	65	0
Federal Agencies*	0	0	0	0	0	0	0	0
TOTALS	740	118	399	517	547	573	105	59

TABLE E1-A
STARS SUBSCRIBER UNIT COUNTS - PHASE I

COV AGENCY	Control Stations by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Total Console Quantities	Initial Encrypted C. Stations
	Command	Staff					
Alcoholic Beverage Control*	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	2	0
Dept. of Conservation & Recreation	0	5	5	6	6	0	0
Dept. of Corrections	2	7	9	10	10	0	0
Dept. of Emergency Management	1	1	2	3	3	4	0
Dept. of Environmental Quality	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0	0
Dept. of Forestry	0	3	3	4	4	0	0
Dept. of Game & Inland Fisheries*	1	0	1	2	2	1	1
Dept. of Health	0	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0	0
Dept. of Juvenile Justice	2	4	6	7	7	0	0
Marine Resources Commission*	0	0	0	0	0	0	0
Dept. of Military Affairs*	3	0	3	4	4	1	1
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0
Dept. of Motor Vehicles	1	2	3	4	4	0	0
State Police*	2	6	8	9	9	8	3
Dept. of Transportation	11	54	65	69	72	0	0
Federal Agencies*	0	0	0	0	0	0	0
TOTALS	23	82	105	118	121	16	5

TABLE E1-A
STARS SUBSCRIBER UNIT COUNTS - PHASE I

COV AGENCY	Consoles by Tier			Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total
	High	Medium	Basic			
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	2	0	0	2	3	3
Dept. of Conservation & Recreation	0	0	0	0	0	0
Dept. of Corrections	0	0	0	0	0	0
Dept. of Emergency Management	4	0	0	4	5	5
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	0	0	0	0	0	0
Dept. of Game & Inland Fisheries*	0	1	0	1	2	2
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0
Marine Resources Commission*	0	0	0	0	0	0
Dept. of Military Affairs*	0	1	0	1	2	2
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	0	0	0
State Police*	8	0	0	8	9	9
Dept. of Transportation	0	0	0	0	0	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	14	2	0	16	21	21

TABLE E1-A
STARS SUBSCRIBER UNIT COUNTS - PHASE I

COV AGENCY	Total V. Rep. Quantities	Vehicular Repeaters Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Total MCT Quantities	MCTs by Tier			5 Year Growth Initial Total	10-Year Growth Initial Total
						Rugged	Standard	Initial Total		
Alcoholic Beverage Control*	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Aviation	**0**	0	0	0	**0**	0	0	0	0	0
Capitol Police*	**0**	0	0	0	**18**	2	16	18	19	20
Dept. of Conservation & Recreation	**18**	18	19	20	**10**	10	0	10	11	11
Dept. of Corrections	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Emergency Management	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Environmental Quality	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Fire Programs	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Forestry	**3**	3	4	4	**2**	0	2	2	3	3
Dept. of Game & Inland Fisheries*	**49**	49	52	54	**40**	40	0	40	42	44
Dept. of Health	**0**	0	0	0	**2**	0	2	2	3	3
Dept. of Information Technology	**0**	0	0	0	**8**	1	7	8	9	9
Dept. of Juvenile Justice	**0**	0	0	0	7	1	6	7	8	8
Marine Resources Commission*	**15**	15	16	17	**22**	4	18	22	24	25
Dept. of Military Affairs*	**0**	0	0	0	**4**	4	0	4	5	5
Dept. of Mines, Minerals & Energy	**0**	0	0	0	**0**	0	0	0	0	0
Dept. of Motor Vehicles	**0**	0	0	0	**14**	1	13	14	15	16
State Police*	**344**	344	362	379	**275**	248	27	275	289	303
Dept. of Transportation	**138**	138	145	152	**37**	37	0	37	39	41
Federal Agencies*	**0**	0	0	0	**0**	0	0	0	0	0
TOTALS	**567**	**567**	**598**	**626**	**439**	**348**	**91**	**439**	**467**	**488**

TABLE E-1B
STARS SUBSCRIBER UNIT COUNTS - PHASE II

COV AGENCY	Mobile Radios by Tier			5-Year Growth	10-Year Growth	Initial Encrypted
	Command	Staff	Initial Total	Initial Total	Initial Total	Mobiles
Alcoholic Beverage Control*	57	0	57	60	63	**0**
Dept. of Aviation	0	0	0	0	0	**0**
Capitol Police*	0	0	0	0	0	**0**
Dept. of Conservation & Recreation	2	56	58	61	64	**18**
Dept. of Corrections	39	115	154	162	170	**0**
Dept. of Emergency Management	3	3	6	7	7	**0**
Dept. of Environmental Quality	0	0	0	0	0	**0**
Dept. of Fire Programs	0	0	0	0	0	**0**
Dept. of Forestry	21	227	248	261	273	**0**
Dept. of Game & Inland Fisheries*	30	150	180	189	198	**70**
Dept. of Health	3	6	9	10	10	**0**
Dept. of Information Technology	0	0	0	0	0	**0**
Dept. of Juvenile Justice	0	0	0	0	0	**1**
Marine Resources Commission*	36	96	132	139	146	**25**
Dept. of Military Affairs*	0	0	0	0	0	**1**
Dept. of Mines, Minerals & Energy	4	11	15	16	17	**0**
Dept. of Motor Vehicles	5	15	20	21	22	**0**
State Police*	213	639	852	895	938	**256**
Dept. of Transportation	277	1110	1387	1457	1526	**0**
Federal Agencies*	7	20	27	29	30	**9**
TOTALS	**697**	**2448**	**3145**	**3307**	**3464**	**380**

Notes:

1. Console quantities derived from COV Need s Assessment Report, Revision 1, dated March 14, 2001

2. * - Agencies requiring encrypted radios for their operations.

TABLE E-1B
STARS SUBSCRIBER UNIT COUNTS - PHASE II

COV AGENCY	Portable Radios by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Portables
	Command	Staff				
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	3	50	53	56	59	0
Dept. of Corrections	21	61	82	87	91	0
Dept. of Emergency Management	2	5	7	8	8	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	4	136	140	147	154	0
Dept. of Game & Inland Fisheries*	19	51	70	74	77	21
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0
Marine Resources Commission*	8	0	8	9	9	3
Dept. of Military Affairs*	3	7	10	11	11	3
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	5	14	19	20	21	0
State Police*	0	0	0	0	0	0
Dept. of Transportation	26	0	26	28	29	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	**91**	**324**	**415**	**440**	**459**	**27**

TABLE E-1B
STARS SUBSCRIBER UNIT COUNTS - PHASE II

COV AGENCY	Control Stations by Tier			5-Year Growth	10-Year Growth	Initial Encrypted
	Command	Staff	Initial Total	Initial Total	Initial Total	C. Stations
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	10	10	11	11	0
Dept. of Corrections	5	17	22	24	25	0
Dept. of Emergency Management	1	4	5	6	6	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	0	5	5	6	6	0
Dept. of Game & Inland Fisheries*	2	0	2	3	3	1
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0
Marine Resources Commission*	0	1	1	2	2	1
Dept. of Military Affairs*	1	0	1	2	2	1
Dept. of Mines, Minerals & Energy	0	1	1	2	2	0
Dept. of Motor Vehicles	1	2	3	4	4	0
State Police*	4	12	16	17	18	5
Dept. of Transportation	20	95	115	121	127	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	**34**	**147**	**181**	**198**	**206**	**8**

TABLE E-1B
STARS SUBSCRIBER UNIT COUNTS - PHASE II

COV AGENCY	Consoles by Tier			Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total
	High	Medium	Basic			
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	0	0	0	0	0
Dept. of Corrections	0	0	0	0	0	0
Dept. of Emergency Management	0	0	0	0	0	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	4	0	0	4	5	5
Dept. of Game & Inland Fisheries*	0	0	0	0	0	0
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0
Marine Resources Commission*	1	0	0	1	2	2
Dept. of Military Affairs*	1	0	0	1	2	2
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	0	0	0
State Police*	16	0	0	16	17	18
Dept. of Transportation	1	0	0	1	2	2
Federal Agencies*	0	0	0	0	0	0
TOTALS	**23**	**0**	**0**	**23**	**28**	**29**

TABLE E-1B
STARS SUBSCRIBER UNIT COUNTS - PHASE II

COV AGENCY	Vehicular Repeaters Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	MCTs by Tier		Initial Total	5 Year Growth Initial Total	10-Year Growth Initial Total
				Rugged	Standard			
Alcoholic Beverage Control*	0	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0	0	0
Dept. of Conservation & Recreation	18	19	20	28	0	28	30	31
Dept. of Corrections	0	0	0	0	0	0	0	0
Dept. of Emergency Management	0	0	0	25	0	25	27	28
Dept. of Environmental Quality	0	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0	0	0
Dept. of Forestry	3	4	4	0	8	8	9	9
Dept. of Game & Inland Fisheries*	51	54	57	83	0	83	88	92
Dept. of Health	0	0	0	0	3	3	4	4
Dept. of Information Technology	0	0	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0	0	0
Marine Resources Commission*	55	58	61	11	49	60	63	66
Dept. of Military Affairs*	0	0	0	0	0	0	0	0
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	2	16	18	19	20
State Police*	360	378	396	355	39	394	414	434
Dept. of Transportation	244	257	269	96	0	96	101	106
Federal Agencies*	0	0	0	0	0	0	0	0
TOTALS	**731**	**770**	**807**	**600**	**115**	**715**	**755**	**790**

TABLE E-1C
STARS SUBSCRIBER UNIT COUNTS - PHASE III

COV AGENCY	Mobile Radios by Tier			5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Mobiles
	Command	Staff	Initial Total			
Alcoholic Beverage Control*	45	0	45	48	50	**0**
Dept. of Aviation	0	0	0	0	0	**0**
Capitol Police*	0	0	0	0	0	**0**
Dept. of Conservation & Recreation	1	21	22	24	25	**18**
Dept. of Corrections	6	16	22	24	25	**0**
Dept. of Emergency Management	3	4	7	8	8	**0**
Dept. of Environmental Quality	0	0	0	0	0	**0**
Dept. of Fire Programs	0	0	0	0	0	**0**
Dept. of Forestry	6	64	70	74	77	**0**
Dept. of Game & Inland Fisheries*	10	50	60	63	66	**70**
Dept. of Health	1	2	3	4	4	**0**
Dept. of Information Technology	0	0	0	0	0	**0**
Dept. of Juvenile Justice	0	1	1	2	2	**1**
Marine Resources Commission*	0	1	1	2	2	**2**
Dept. of Military Affairs*	0	0	0	0	0	**1**
Dept. of Mines, Minerals & Energy	0	1	1	2	2	**0**
Dept. of Motor Vehicles	6	19	25	27	28	**0**
State Police*	189	567	756	794	832	**227**
Dept. of Transportation	246	984	1230	1292	1353	**0**
Federal Agencies*	28	84	112	118	124	**34**
TOTALS	**541**	**1814**	**2355**	**2482**	**2598**	**353**

NOTES:
1. **Console quantities derived from COV Needs Assessment Report, Rev. 1, dated March 14, 2001**
2. *** - Agencies requiring encrypted radios for their operations**

TABLE E-1C
STARS SUBSCRIBER UNIT COUNTS - PHASE III

COV AGENCY	Portable Radios by Tier			5-Year Growth	10-Year Growth	Initial Encrypted
	Command	Staff	Initial Total	Initial Total	Initial Total	Portables
Alcoholic Beverage Control*	0	0	0	0	0	**0**
Dept. of Aviation	0	0	0	0	0	**0**
Capitol Police*	0	0	0	0	0	**0**
Dept. of Conservation & Recreation	2	22	24	26	27	**0**
Dept. of Corrections	7	19	26	28	29	**0**
Dept. of Emergency Management	2	4	6	7	7	**0**
Dept. of Environmental Quality	0	0	0	0	0	**0**
Dept. of Fire Programs	0	0	0	0	0	**0**
Dept. of Forestry	1	37	38	40	42	**0**
Dept. of Game & Inland Fisheries*	0	0	0	0	0	**0**
Dept. of Health	0	0	0	0	0	**0**
Dept. of Information Technology	0	0	0	0	0	**0**
Dept. of Juvenile Justice	5	15	20	21	22	**0**
Marine Resources Commission*	0	1	1	2	2	**1**
Dept. of Military Affairs*	0	0	0	0	0	**0**
Dept. of Mines, Minerals & Energy	0	0	0	0	0	**0**
Dept. of Motor Vehicles	3	9	12	13	14	**0**
State Police*	0	0	0	0	0	**0**
Dept. of Transportation	15	0	15	16	17	**0**
Federal Agencies*	0	0	0	0	0	**0**
TOTALS	**35**	**107**	**142**	**153**	**160**	**1**

TABLE E-1C
STARS SUBSCRIBER UNIT COUNTS - PHASE III

COV AGENCY	Control Stations by Tier			5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted C. Stations
	Command	Staff	Initial Total			
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	5	5	6	6	0
Dept. of Corrections	1	5	6	7	7	0
Dept. of Emergency Management	2	5	7	8	8	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	0	1	1	2	2	0
Dept. of Game & Inland Fisheries*	1	0	1	2	2	1
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	1	1	2	2	0
Marine Resources Commission*	0	0	0	0	0	0
Dept. of Military Affairs*	0	0	0	0	0	0
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	1	3	4	5	5	0
State Police*	4	12	16	17	18	5
Dept. of Transportation	12	56	68	72	75	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	21	88	109	121	125	6

TABLE E-1C
STARS SUBSCRIBER UNIT COUNTS - PHASE III

COV AGENCY	Consoles by Tier			Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total
	High	Medium	Basic			
Alcoholic Beverage Control*				0	0	0
Dept. of Aviation				0	0	0
Capitol Police*				0	0	0
Dept. of Conservation & Recreation				0	0	0
Dept. of Corrections				0	0	0
Dept. of Emergency Management				0	0	0
Dept. of Environmental Quality				0	0	0
Dept. of Fire Programs				0	0	0
Dept. of Forestry				0	0	0
Dept. of Game & Inland Fisheries*				0	0	0
Dept. of Health				0	0	0
Dept. of Information Technology				0	0	0
Dept. of Juvenile Justice				0	0	0
Marine Resources Commission*				0	0	0
Dept. of Military Affairs*				0	0	0
Dept. of Mines, Minerals & Energy				0	0	0
Dept. of Motor Vehicles				0	0	0
State Police*	16			16	17	18
Dept. of Transportation	1			1	2	2
Federal Agencies*				0	0	0
TOTALS	17	0	0	17	19	20

TABLE E-1C
STARS SUBSCRIBER UNIT COUNTS - PHASE III

COV AGENCY	Vehicular Repeaters Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	MCTs by Tier			5 Year Growth Initial Total	10-Year Growth Initial Total
				Rugged	Standard	Initial Total		
Alcoholic Beverage Control*	0	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0	0	0
Dept. of Conservation & Recreation	18	19	20	14	0	14	15	16
Dept. of Corrections	0	0	0	0	0	0	0	0
Dept. of Emergency Management	0	0	0	2	0	2	3	3
Dept. of Environmental Quality	0	0	0	0	15	15	16	17
Dept. of Fire Programs	0	0	0	0	0	0	0	0
Dept. of Forestry	3	4	4	0	0	0	0	0
Dept. of Game & Inland Fisheries*	50	53	55	26	0	26	28	29
Dept. of Health	0	0	0	0	3	3	4	4
Dept. of Information Technology	0	0	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	1	1	2	2
Marine Resources Commission*	0	0	0	1	10	11	12	13
Dept. of Military Affairs*	0	0	0	0	0	0	0	0
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	1	7	8	9	9
State Police*	311	327	343	432	48	480	504	528
Dept. of Transportation	137	144	151	61	0	61	65	68
Federal Agencies*	0	0	0	0	0	0	0	0
TOTALS	**519**	**547**	**573**	**537**	**84**	**621**	**658**	**689**

TABLE E-1D
STARS SUBSCRIBER UNIT COUNTS - PHASE IV

COV AGENCY	Mobile Radios by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Mobiles
	Command	Staff				
Alcoholic Beverage Control*	35	0	35	37	39	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	2	43	45	48	50	18
Dept. of Corrections	18	52	70	74	77	0
Dept. of Emergency Management	4	5	9	10	10	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	13	146	159	167	175	0
Dept. of Game & Inland Fisheries*	19	94	113	119	125	69
Dept. of Health	1	3	4	5	5	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	0	1	1	2	2	0
Marine Resources Commission*	0	0	0	0	0	0
Dept. of Military Affairs*	0	0	0	0	0	0
Dept. of Mines, Minerals & Energy	33	99	132	139	146	0
Dept. of Motor Vehicles	7	19	26	28	29	0
State Police*	180	540	720	756	792	216
Dept. of Transportation	286	1144	1430	1502	1573	0
Federal Agencies*	11	32	43	46	48	13
TOTALS	609	2178	2787	2933	3071	316

NOTES:
1. **Console quantities derived from COV Needs Assessment Report, Rev. 1, dated March 14, 2001**
2. *** - Agencies requiring encrypted radios for their operations**

TABLE E-1D
STARS SUBSCRIBER UNIT COUNTS - PHASE IV

COV AGENCY	Portable Radios by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted Portables
	Command	Staff				
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	4	67	71	75	79	0
Dept. of Corrections	15	43	58	61	64	0
Dept. of Emergency Management	2	6	8	9	9	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	3	106	109	115	120	0
Dept. of Game & Inland Fisheries*	10	32	42	45	47	**13**
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	1	5	6	7	7	0
Marine Resources Commission*	0	0	0	0	0	0
Dept. of Military Affairs*	5	15	20	21	22	6
Dept. of Mines, Minerals & Energy	1	3	4	5	5	0
Dept. of Motor Vehicles	6	18	24	26	27	0
State Police*	1	3	4	5	5	2
Dept. of Transportation	24	0	24	26	27	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	**72**	**298**	**370**	**395**	**412**	**21**

TABLE E-1D
STARS SUBSCRIBER UNIT COUNTS - PHASE IV

COV AGENCY	Control Stations by Tier		Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	Initial Encrypted C. Stations
	Command	Staff				
Alcoholic Beverage Control*	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	11	11	12	13	0
Dept. of Corrections	3	12	15	16	17	0
Dept. of Emergency Management	10	30	40	42	44	0
Dept. of Environmental Quality	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0
Dept. of Forestry	0	3	3	4	4	0
Dept. of Game & Inland Fisheries*	2	0	2	3	3	1
Dept. of Health	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0
Dept. of Juvenile Justice	1	1	2	3	3	0
Marine Resources Commission*	0	0	0	0	0	0
Dept. of Military Affairs*	2	0	2	3	3	1
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0
Dept. of Motor Vehicles	1	1	2	3	3	0
State Police*	4	12	16	17	18	5
Dept. of Transportation	17	85	102	108	113	0
Federal Agencies*	0	0	0	0	0	0
TOTALS	40	155	195	211	221	7

TABLE E-1D
STARS SUBSCRIBER UNIT COUNTS - PHASE IV

COV AGENCY	Consoles by Tier			Initial Total	5-Year Growth	5-Year Initial Total	10-Year Growth	10-Year Initial Total
	High	Medium	Basic					
Alcoholic Beverage Control*	0	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0	0	0
Dept. of Conservation & Recreation	0	0	0	0	0	0	0	0
Dept. of Corrections	0	0	0	0	0	0	0	0
Dept. of Emergency Management	0	0	0	0	0	0	0	0
Dept. of Environmental Quality	0	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0	0	0
Dept. of Forestry	0	0	0	0	0	0	0	0
Dept. of Game & Inland Fisheries*	0	0	0	0	0	0	0	0
Dept. of Health	0	0	0	0	0	0	0	0
Dept. of Information Technology	0	0	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	0	0	0
Marine Resources Commission*	0	0	0	0	0	0	0	0
Dept. of Military Affairs*	0	0	0	1	2	2	2	2
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	0	0	0	0	0
State Police*	16	0	0	16	17	17	18	18
Dept. of Transportation	0	0	0	0	0	0	0	0
Federal Agencies*	0	0	0	0	0	0	0	0
TOTALS	**16**	**0**	**0**	**17**	**19**	**19**	**20**	**20**

TABLE E-1D
STARS SUBSCRIBER UNIT COUNTS - PHASE IV

COV AGENCY	Total V. Rep. Quantities	Vehicular Repeaters Initial Total	5-Year Growth Initial Total	10-Year Growth Initial Total	MCTs by Tier			5 Year Growth Initial Total	10-Year Growth Initial Total
					Rugged	Standard	Initial Total		
Alcoholic Beverage Control*	0	0	0	0	0	0	0	0	0
Dept. of Aviation	0	0	0	0	0	0	0	0	0
Capitol Police*	0	0	0	0	0	0	0	0	0
Dept. of Conservation & Recreation	18	18	19	20	28	0	28	30	31
Dept. of Corrections	0	0	0	0	0	0	0	0	0
Dept. of Emergency Management	0	0	0	0	3	0	3	4	4
Dept. of Environmental Quality	0	0	0	0	0	0	0	0	0
Dept. of Fire Programs	0	0	0	0	0	0	0	0	0
Dept. of Forestry	3	3	4	4	0	4	4	5	5
Dept. of Game & Inland Fisheries*	50	50	53	55	51	0	51	54	57
Dept. of Health	0	0	0	0	0	2	2	3	3
Dept. of Information Technology	0	0	0	0	0	0	0	0	0
Dept. of Juvenile Justice	0	0	0	0	0	1	1	2	2
Marine Resources Commission*	0	0	0	0	0	0	0	0	0
Dept. of Military Affairs*	0	0	0	0	0	0	0	0	0
Dept. of Mines, Minerals & Energy	0	0	0	0	0	0	0	0	0
Dept. of Motor Vehicles	0	0	0	0	2	18	20	21	22
State Police*	304	304	320	335	319	35	354	372	390
Dept. of Transportation	231	231	243	255	66	0	66	70	73
Federal Agencies*	0	0	0	0	0	0	0	0	0
TOTALS	606	606	639	669	469	60	529	561	587

19.16 BASS – Driver Training (1 per Communications Zone – 13 total) (Priority Level Routine) - One talk group is provided for BASS Driver Training purposes.

19.17 BASS – Field Training (1 per Communications Zone –13 total) (Priority Level Routine) - One talk group is provided for BASS Training Division use.

19.18 VSP Management (1 per agency – available all zones) (Priority Level Routine) - This talk group is reserved for use by senior VSP management.

19.19 VSP HQ Staff (1 per agency –available all zones) (Priority Level Routine) - This talk group is for use by personnel assigned to VSP Headquarters.

19.20 STARS Team Statewide (1 per VSP agency – available all zones) – This talk group is for use by personnel assigned to the STARS team.

19.21 STARS Team Divisional (1 per VSP Division – 7 total) – These talk groups are for use by personnel assigned to the STARS team.

19.2~~2~~**0** VSP Emergency (911) (1 per STARS Communications Zone –13 total) (Priority Level High) – All units would be equipped with this talk group. It will be used only in the event there was a need to contact the VSP Division Dispatch Center by units in the area served by that Communications Zone.

19.2~~1~~**3** Interagency Working (Interop) (3 per STARS Communications Zone – 39 total) (Priority Level Urgent) – This talk group will be used for those situations where on-going requirements require communications among and between units of various STARS user agencies and departments.

20.0 VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT)

541 agency specific and 52 common talk-groups are provided for Virginia Department of Transportation. Each of the 9 VDOT districts would have a district operations talk group. A separate talk group is provided for the 45 Residencies, and two talk groups are provided for each of the departments 243 areas. VDOT units in an area will monitor the area operations channel. A unit will call the unit it needs to communicate with then, once contact is established, the units involved switch to a more localized working channel to communicate. When finished, the units involved switch back to the operations channel. In addition to the agency specific talk groups, four common talk groups are provided for each of the 13 Communications Zones. One is for emergency contact with a VSP dispatcher at the appropriate VSP Divisional Dispatch Centers and three for inter-agency operations. A description of the talk groups is as follows:

TABLE G-1

Appendix G		COV AGENCY TALK GROUPS																		
Agency	ABC	Aviation	Capitol Police	Conserv & Recreation	Corrections	Emer Mgt	EQ	Fire Prog	Forestry	Game	Health	IT	Juvenile J	Marine Res.	Military Affairs	Mines	DMV	VSP	VDOT
ABC																			
Regional Opns	8																		
Regional Wkfrce	16																		
Management	1																		
Aviation																			
Operations		2																	
Capitol Police																			
Management			1																
Supervisory			1																
Investigative			1																
Traffic Control			1																
Fixed Post			1																
Special Ops			3																
Admin Services			1																
Dispatch			1																
Enforcement			1																
Shared			1																
Consv & Rec.																			
District LE				6															
Park Opns				50															
Special Opns				6															
DCR Management				1															
Corrections																			
Regional Opns					4														
Inmate Transport					4														
Work Gangs					4														
Emer. Mgt.																			
Region Opns						3													
Regional Wkfrce						6													
HAZMAT						6													
VEOC Staff						1													
VDEM Management						1													
IFLOWS						3													
EQ																			
Regional Opns							7												
Regional Wkfrce							14												
DEQ Management							1												
Fire Programs																			
Operations								26											
Forestry																			
Regional Opns									6										
Regional Workforce									12										
Management									1										
Administrative									6										
State Forests									12										
Nurseries									12										
Fireground									12										
Game & Inland Fisheries																			
Regional Opns										5									
Regional Wkfrce										10									
Law Enforcement										5									
Wildlife Division										5									
Fisheries Division										5									
Maintenance										5									
Wildlife Diversity										5									
Training										5									
Special Opns										10									
Administration										5									
Management										1									
Health																			
District Opns											4								
District Wkfrce											8								
Env. Opns											8								
Shellfish Sanitation											4								
Radiological Health											4								
Chief Medical Examiner											4								
Epidemiology											4								
Special Operations											8								
Management											1								

TABLE G-1

Appendix G	COV AGENCY TALK GROUPS																	
Agency	ABC	Aviation	Capitol Police	Conserv & Recreation	Corrections	Emer Mgt	EQ	Fire Prog	Forestry	Game	Health	IT	Juvenile J	Marine Res	Military Affairs	Mines	DMV	VSP	VDOT
DIT																			
Operations												1							
Fire Brigade												1							
Maintenance												1							
Engineering												1							
Planning												1							
Management												1							
Juvenile Justice																			
Regional Ops													3						
Transportation													3						
Maintenance													3						
Regional Mgmt													3						
Management													1						
Marine Resources																			
Area Ops														4					
Area Wildlife Chiefs														8					
Management														1					
Investigations														4					
Law Enforcement														4					
Military Affairs																			
TAC Operations															2				
Army Aviation Ops															1				
Ft Pickett Police & Fire															1				
Ft Pickett Public Works															1				
Ft Pickett Range Ops															1				
Ft Pickett Logistics Ops															1				
Ft Pickett Command															1				
Subarea Command															4				
Area Operations															8				
DMA Command															1				
Mines																			
Area Ops																10			
Area Wildlife																20			
Management																1			
DMV																			
District Ops																	6		
District Wildlife																	12		
District Law Enforcement																	6		
District Truck Weight																	6		
Management																	1		
VSP																			
BFO Dispatch																		14	
WCIN																		14	
BFO Service																		14	
BFO Wildlife																		14	
BFO Special Ops																		28	
BFO - Aviation																		13	
BFO - Speed Enforcement																		13	
BFO - Tactical																		26	
BFO - SIRS/Interop																		13	
BFO - Emer Protect																		13	
BCI Special Ops																		13	
BCI Admin																		13	
BASS Division Ops																		13	
BASS - Comm. Maint																		13	
BASS - Property Maint																		13	
BASS - Driver Training																		13	
BASS - Field Training																		13	
VSP Management																		1	
STARS Team																		8	
VSP HQ Staff																		1	
VDOT																			
District Ops																			9
Residency Ops																			45
Area Ops																			243
Area Wildlife																			243
Management																			1
Agency Totals	25	2	12	43	12	20	22	26	61	61	45	6	13	21	21	31	31	263	541

Mobile Computer Command Interface for the Virginia State Police Computer Aided Dispatch System

Functional Design Specification

Table of Revisions:

Revision:	Date:	Reason:
A	04/04/2001	Draft distributed for comments
00	05/15/2001	Initial Release
01	07/3/2001	Changed the port assignment specification in section 2.3 from dynamic allocation to static assignment.
02	7/11/2001	Added Traffic Stop Summary (TSS) command description and, an applicable Response message for the Clear command.
03	09/27/2001	Changed message formats to use the ASCII Field Separator character. Miscellaneous corrections and clarifications.

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Appendixes:

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1.0 Introduction

1.1 Purpose

This document defines the Mobile Computer Terminal (MCT) Command Interface for the Virginia State Police (VSP) Computer Aided Dispatch (CAD) system. The intent of this specification is to define a general interface that will facilitate the integration of a Mobile Data Computer/Terminal system with the VSP CAD system. In keeping with this intent, MCT functionality, other than what is inherent or implied by the interface, is beyond the scope of this specification. The MCT user-interface and visual presentation format for entering and displaying commands will be specified in requirements documents for the Mobile Computer Terminal System. The only MCT System requirements imposed by this specification are that all commands and associated data elements must be supported and that all command messages must comply with the formats and protocol specified.

1.2 System Overview

Figure 1-1 below is a high-level block diagram of the VSP CAD and associated systems. A brief description of each system represented in the diagram is provided in Table 1-1.

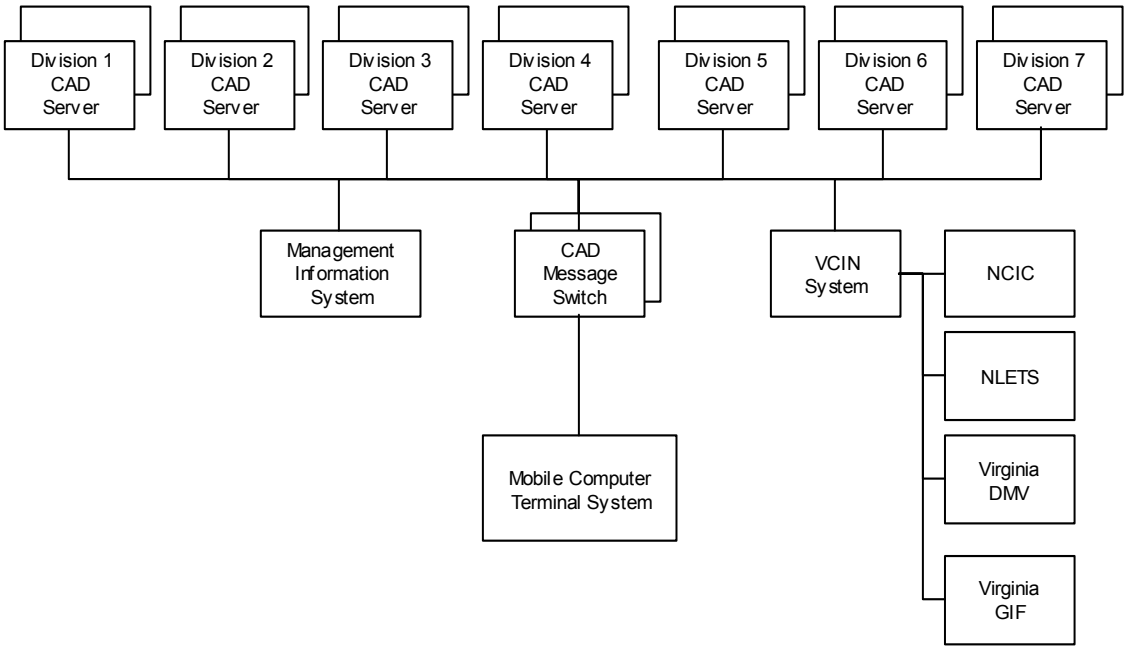

Figure 1-1 VSP CAD and Associated Systems

Table 1-1 System Descriptions

Division CAD Servers	Each of the seven VSP divisions have autonomous CAD systems that consists of dual DEC AlphaServer™(s), a shared mass storage array, and a minimum of five Windows NT Workstation™ dispatch terminals. One of the CAD servers is the operational system while the other provides fail-over redundancy and system test capability.
CAD Message Switch	The CAD Message Switch is a component of the Mobile Computer Command Interface. The switch consists of primary and backup DEC AlphaServer™ computer systems with a shared mass storage array. The Message Switch will be responsible for mobile user access security, MCT message traffic routing, and message activity logging. The links between the CAD Message Switch and Division CAD servers will be a native VSP Wide Area Network connection with a link data rate of not less than 1.5 Mb/sec.
Management Information System (MIS)	The MIS is a Windows NT Server™ based repository for all CAD History file information. Computer users, with access to the VSP network, may query the History information database using a standard Internet web browser.
VCIN	The Virginia Criminal Information Network maintains a central database for Criminal Justice agencies throughout the Commonwealth. In addition, VCIN provides access to databases maintained by the Virginia Departments of Motor Vehicles and Game and Inland Fisheries, the National Crime Information Center (NCIC), and out-of-state agencies by way of the National Law Enforcement Telecommunications System (NLETS).
Mobile Computer Terminal System	Components of the MCT System may vary depending on the particular system employed. Typically, they will include vehicle mounted PCs, a wireless communications facility, a centralized message switch, and an access gateway. The link between the MCT System access gateway and the CAD Message Switch will be a VSP native, Local Area Network connection, with a data rate of not less than 10 Mb/sec. Properties of the wireless network used to interconnect the MCT System will be defined by the wireless technology and service provider.

2.0 Systems Communication

This section provides specific information/requirements related to the network protocol layers used for communication with and by the Command Interface, CAD Message Switch system. The discussions that follow reference components of the diagram in Figure: 2-1.

2.1 Network Addressing

Internet Protocol (IP) addressing will be used throughout the network. When applicable, it is presumed that the Wireless Network Provider for the MCT System will furnish ICANN[1] assigned IP addresses for all components of the mobile system and, the CAD Message Switch network interface to the mobile system. The Network Address Translator (NAT) feature will be utilized such that the CAD Message Switch will appear as a node on the mobile network. All other IP addresses required will be assigned by VSP. Configuration and management of Network Layer Routing Protocol, if required by the mobile system, will be the responsibility of the Wireless Network Provider. If it is determined that a firewall device is required between the MCT System access gateway and CAD Message Switch, the device will be provided and managed by VSP.

2.2 Network Protocol

Transmission Control Protocol (TCP) will be utilized to provide guaranteed delivery of all message traffic between systems. It will be the responsibility of each system to provide an internal message queuing mechanism. Application protocols such as TELNET, FTP, and TFTP will be supported for systems administration, but not for general use by MCT users.

2.3 CAD Message Switch Interface

2.3.1 Physical/Internet

The CAD Message Switch Local Area Network (LAN) connection(s) will be Ethernet/IEEE 802.3 (10/100BaseT). While the initial configuration specifies a single network interface adapter, the option for a second adapter is reserved to allow configuration flexibility and/or performance enhancement. The inclusion of a second adapter does not imply that the CAD Message Switch will perform IP protocol routing or support any Network Layer Routing Protocols.

2.3.2 Transport

From a functional standpoint, the CAD Message switch can be viewed as having two logical network interfaces. Message communications with the MCT System will use the **Mobile System Interface**. Command, query, and response messages between the CAD Message Switch and Division CAD servers, MIS, and the VCIN Network, will use the **Host Systems Interface**.

2.3.2.1 Mobile System Interface

The CAD Message Switch will maintain TCP port number and IP address definitions for assignment to the mobile system. Unique port numbers will be assigned to each MCT for establishing individual bi-directional socket

[1] Internet Corporation for Assigned Names and Numbers

connections with the CAD Message Switch. The port number assignments will be administered consistent with the CAD Message Switch terminal security mechanism. Each TCP port number will be associated with an IP address and the combination assigned to a specific MCT. Assigned port and address values must be configured within an MCT before the MCT can communicate with the CAD Message Switch.

2.3.2.2 Host Systems Interface

TCP socket connections, between the CAD Message Switch and Division CAD Servers, will be established. Initialization of these connections will be attempted at systems startup and, individually, whenever a loss of connection is detected. If a connection is lost with any CAD Server or VCIN, the CAD Message Switch will continuously attempt to re-connect. The VCIN connection will be the same as currently exists on the Division CAD Servers. This connection consists of a bi-directional TCP socket utilizing port 6800.

2.3.3 Session (Connect/Disconnect)

The mobile user must initially issue an **OPER**[2] command to establish a MCT session connection with the CAD Message Switch. Conversely, to conclude the session, an **OP OFF**[3] command must be sent to terminate the connection.

2.3.3.1 Connection Security

CAD Message Switch Logon by a MCT user will require all of the following elements to match an entry in the CAD Message Switch security file:

1. The mobile user's VSP assigned Unit or Badge number.
2. The mobile user's VSP assigned Code number.
3. Eight character Password.

Refer to the **OPER** and **PASSWORD** commands for element details and requirements.

2.3.4 Application (Messages)

The required character string format for CAD Interface messages is defined in Section 3 of this document. Additional message formatting details may be found in the individual Command descriptions in Sections 4 and
5.

[2] Reference section 4.1 for details of the **OPER** command.
[3] Reference section 4.3 for details of the **OP OFF** command.

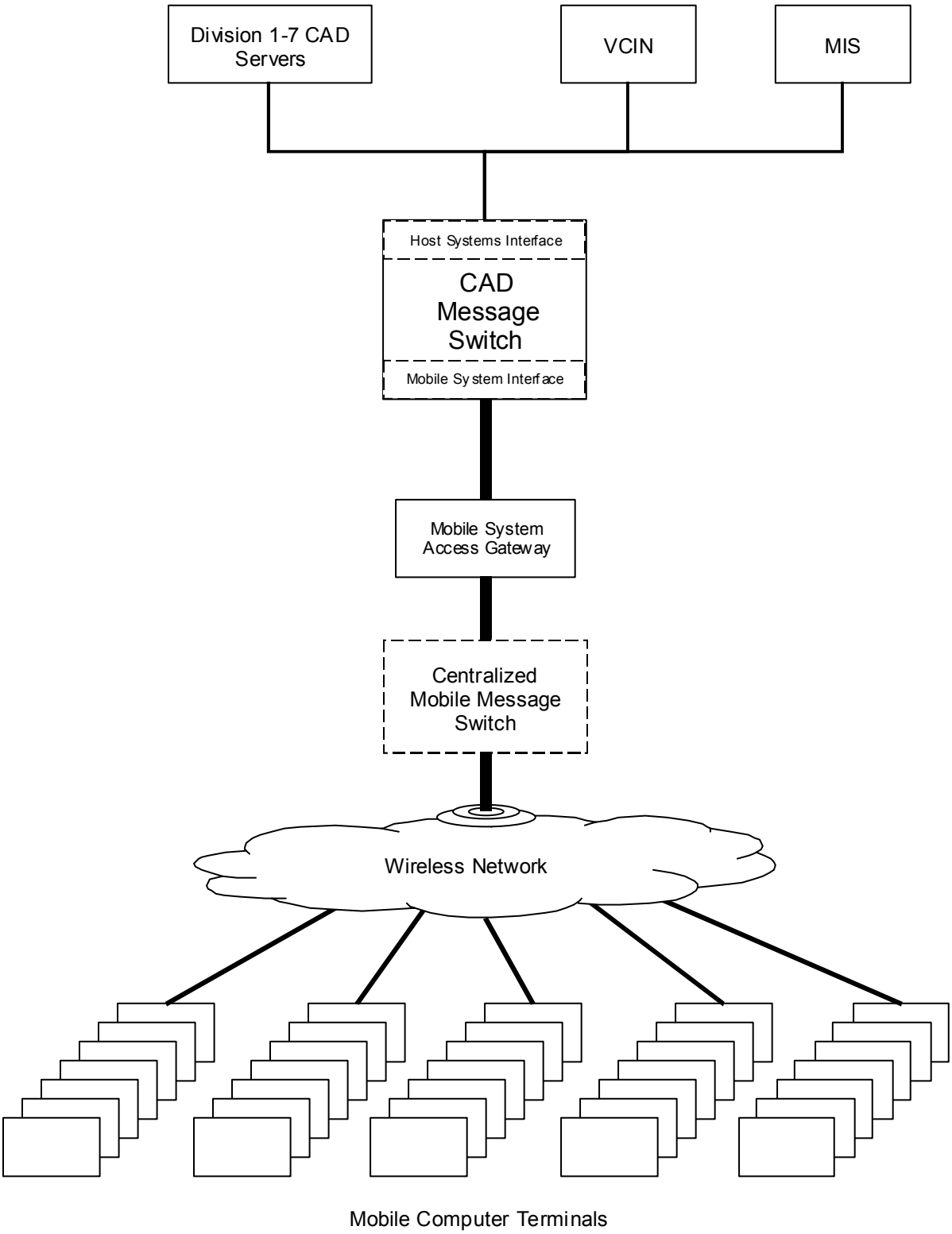

Figure 2-1 CAD Message Switch Interconnections

3.0 Message formats

All messages transmitted between the MCT and CAD Message Switch systems are ASCII encoded character strings in the format applicable for Command or Response messages. These formats are detailed in the following sub-sections.

3.1 Command messages:

<STX> USERID **<FS>** CMD **<FS>** VAR^1 **<FS>**…**<FS>** VAR^n **<FS>** **<ETX>**

Where:

<STX>	=	Start of Text indicator. (ASCII x02)
<FS>	=	Field Separator. (ASCII x1C)
USERID	=	Unit number of the originating MCT user or, a CAD Terminal ID
CMD	=	Character code for CAD or VCIN Query commands.
VAR^1...VAR^n	=	Command specific data elements, first through ^{n}, with ^{n} signifying the last element provided.
<ETX>	=	End of Text indicator. (ASCII x03)

3.2 Response messages:

<STX> USERID **<FS>** TIME **<FS>** RSPMSG **<FS>** **<ETX>**

Where:

<STX>	=	Start of Text indicator. (ASCII x02)
<FS>	=	Field Separator. (ASCII x1C)
USERID	=	Unit number of the destination MCT user or, a CAD Terminal ID.
DATE/TIME	=	System date and time the response message was generated.
RSPMSG	=	Response message field. (14,700 bytes maximum)
<ETX>	=	End of Text indicator. (ASCII x03)

4.0 CAD Commands

The CAD commands supported by the MCT Command Interface are defined in this section. With the exception of three, all command sequences are originated by the MCT user. The **D**ispatch and **A**ssist commands are Dispatcher initiated sequences. Therefore, these two commands will produce unsolicited command messages to the MCT user. The **T**o command may be initiated by a Dispatcher or other CAD System terminal user, including a MCT. For this sequence, an unsolicited text message, in the form of a Response Message, will be sent to the MCT user.

For each command, the purpose, format, data elements, system actions, and response messages are defined. Data element descriptions also include the field length, data type and in some cases, an example. For clarity, representative information may be shown in some of the response examples. Such information is signified by italicized font. (See "Response message variables" example in the conventions listed below)

The terms "MCT user", "Unit" or "Unit's" and, "mobile user" are used universally throughout this document. All references are synonymous with the current user id logged on the MCT system.

The following conventions are used in the CAD Command description tables:

- Command codes are displayed in **UPPERCASE, BOLD, BLOCK** font**.**
  Example: **B**
- The ^ symbol within a command string indicates a required Space (ASCII x20) character.
  Example: **B^**……..
- Required data element identifiers are designated by **UPPERCASE, BOLD, BLOCK** font.
  Example: **B ^ M/**……..
- Required data element variables are displayed in **lowercase, bold, block** font.
  Example: **B ^ M/beginning mileage**
- Optional data elements identifiers are indicated by ***UPPERCASE, BOLD, ITALICISED*** font.
  Example: **B ^ M/beginning mileage ^** ***D/***……
- Optional data element variables are displayed in ***lowercase, bold, italicized*** font.
  Example: **B ^ M/beginning mileage ^** ***D/duty post***
- Fixed length fields are specified by stating the required number of characters.
  Example: Field length – Required 8 numeric characters.
- Variable length fields are specified in maximum number of characters.
  Example: Field length – Maximum 7 alphanumeric characters.
- The text of response messages is displayed within quotation marks.
  Example: "text" indicates TEXT (ASCII x54455854)
- Response message variables are signified by ***italicized*** font.
  Example: **"*1102* Enroute to #DIV*101000001*"**

4.1 OPER (Operator Logon) Command

Purpose: To establish initial contact with the CAD Message Switch, verify username and password, obtain access security level. This command must be sent every time the mobile application is initialized and connection with CAD or VCIN is desired.

Command: **OPER ^ unit ^ code ^ password**

Where: **unit** is the mobile user's Unit or Badge number[4].
Field length – Maximum 5 alphabetic/numeric characters. Example: 3327
code is the mobile user's Department assigned Code[5] number.
Field length – Maximum 5 alphabetic/numeric characters. Example: 5969C
password is the current password for the user.
Field length – Required 8 alphabetic/numeric characters. Example: PAS2W0RD

Actions: **CAD Message Switch**
Verifies user name and password.
If both are valid - determines the Unit's assigned home division and establishes a session link for follow on MCT/CAD/VCIN command transactions.
Notifies the appropriate Division CAD to activate the Mobile Line.
If username and/or password is invalid, an error message is returned to the mobile user.
CAD
Accepts access level security settings from the CAD Message Switch.
Displays that the Mobile Line is Up allowing certain messages to be sent.

Responses: Maximum length – 78 alphanumeric characters.
"*1102* Connected to Division *1* CAD" – if command is successful.
"*1102* Unable to connect to CAD" – if the mobile user's home CAD is unavailable.
"Invalid Code/Password" – if the code and/or password do not match what is on file.
"Password expires in # days" – if the mobile user's password is set to expire in # days[6].

"Password expires today" – if, after 5 consecutive days, the mobile user has not issued
"Last chance to change" a successful **PASSWORD** command.

"Password has expired" – if the mobile user has not responded to all previous expiration
"Contact Supervisor" warning messages.

4.2 PASSWORD (Change Password) Command

Purpose: To allow the mobile user to change the operator sign on password as desired or required.

Command: **PASSWORD ^ old password ^ new password ^ new password**

Where: **old password** is the mobile user's current password.
Field length – Required 8 alphabetic/numeric characters.
new password is the new password. Entered twice for confirmation.
Field length – Required 8 alphabetic/numeric characters.

[4] All mobile users will be assigned a Unit Number by VSP. For law enforcement officer's, Unit Number is their assigned Badge Number.
[5] All mobile users will be assigned a Code Number by VSP. For VSP users, it is their employee code number. For other users, this number will be the same as their assigned Unit Number.
[6] Expiration warning messages will begin 5 days prior to expiration and continue until 1 day remains.

Actions: **CAD Message Switch**
Verifies and updates the mobile user's Password in the security file.
Sends updated password information to all Division CAD systems.
CAD
Updates local security file with password information from the CAD Message Switch. Passwords are retained for 90 days.

Responses: Maximum length – 78 Alphanumeric characters.
"Password has been changed" – if command execution is successful.
"Invalid password entered" – if the entered old password does not match current password on file, or if the new password is not typed twice, identically.

4.3 OP OFF (Operator Logoff) Command

Purpose: To end contact with the CAD Message Switch. This command must be sent every time the mobile data application is to be terminated.

Command: **OP ^ OFF**

Actions: **CAD Message Switch**
Signals the appropriate Division CAD to bring that Mobile Line down.
Unlinks the mobile user from the appropriate Division CAD.
CAD
Will queue any incoming messages destined for the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Terminal signed off" – if the command is successful, response is sent to the mobile user.

4.4 B (Beginning Tour of Duty Logon) Command

Purpose: To log a unit 10-41 with beginning mileage, additional duty post assignment information, special assignment code information, and comments when needed.

Command: **B ^ M/beginning mileage ^ *D/duty post ^ S/special assignment ,comments***

Where: **M/beginning mileage** is the unit's vehicle odometer reading.
Field length – Maximum 6 numeric characters. Example: 76031
D/duty post is the unit's duty post assignment:
Field length – Maximum 7 alphabetic/numeric characters. Example: 010101A
S/special assignment is the unit's special assignment code
Field length – Maximum 3 alphabetic/numeric characters. Example: 154
,***comments*** is any additional comments the unit may want entered into the Unit History.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit is currently in logon status….
If unit provides duty post assignment and or special assignment information, any existing duty post and special assignment information will be overwritten.
If unit does not provide duty post and or special assignment information, existing duty post and special assignment information is retained.
If Unit is not in logon status and not shown as on duty in CAD….
Unit is logged 10-41 with any information supplied.
All information will be recorded in the unit history.
PMSGR command automatically runs to retrieve and forward any personal messages on file for this Unit. Marks the messages as delivered in CAD if they are delivered successfully to the mobile user and updates the Unit History.

Responses: Maximum length – 78 alphanumeric characters.
"*1102* Beginning Mileage Required" – if mileage is not provided.
"*1102* 1041 Information Already Recorded" – if unit has previously marked 10-41
"*1102* 1041 at *HHMM 01A 01J 154*" - if unit has duty post assignment information, the last 3 characters of up to 2 duty post assignments and special assignment code returned. Same information displayed to controlling dispatcher.
"*1102* 1041 at *HHMM* No Road Assignment *154*" – if unit does not provide, and currently does not have, a road assignment set in CAD but does have a special assignment code. Same information displayed to controlling dispatcher.
"*1102* 1041 at *HHMM* No Road Assignment" – if unit does not provide, and currently does not have, a road assignment and special assignment code set in CAD. Same information displayed to controlling dispatcher.

Secondary Responses: If a PMSG (phone message) is on file for the unit marking on, CAD will retrieve the message and send it to the mobile user. The responding message format will be as follows:
to *unit* ^ PMSG ^ *message text*
ENTERED DATE:*MMDDYY* ^ ENTERED TIME:*HHMM*
OPER: *user id*
Maximum length – 285 alphanumeric characters.
Example: **"*1102* PMSG *1021 JOE GREEN AT 555-1212***
ENTERED DATE:*MMDDYY* ENTERED TIME:*HHMM*
OPER:*3327C*"

4.5 LO (Ending Tour of Duty Logoff) Command

Purpose: To log a unit 10-42 with ending mileage and comments when needed.

Command: **LO ^ M/ending mileage ,*comments***

Where: **M/ending mileage** is the unit's vehicle odometer reading.
Field length – Maximum 6 numeric characters. Example: 176031
,*comments* is any additional comments the unit may want entered into the Unit History.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If unit is currently in on duty status and not assigned to an incident….
Unit is logged off. Response sent to mobile user and dispatcher.
If unit is currently assigned to an incident….
Unit is not logged off and an error message is returned to the mobile user.
If unit is not shown on duty in CAD….
Error message is sent to mobile user.
All information will be recorded in the Unit History.

Responses: Maximum length – 78 alphanumeric characters.
"*1102* Ending Mileage Required" – if mileage is not provided.
"*1102* Not Currently Logged On" – if Unit is not shown as on duty in CAD.
"*1102* 1042 at *HHMM*" - if Unit successfully logs off in CAD. Message is sent to mobile user and dispatcher.
"*1102* Assigned, Not Logged Off" – if unit is currently assigned to an incident.

4.6 ER (Enroute to Dispatched Incident) Command

Purpose: To mark a unit enroute to the incident for which they have received a Dispatch message.

Command: **ER ,*comments***

Where: ,***comments*** is any additional comments the unit may want entered into the Unit History.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Unit status is updated, history segments are written to the Unit and Incident Histories.
Response is sent to mobile user and dispatcher.
If Unit has not been dispatched to an incident….
Error message is returned to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"*1102* Enroute to #DIV*101000001*" – normal response with 12 character incident number.
"*1102* Not Currently Dispatched" – if unit is not shown as dispatched in CAD.
"*1102* Already Enroute" - if unit has already marked enroute to an incident.

4.7 OS (Onscene) Command

Purpose: To mark a unit onscene at an incident that they have received a dispatch message for or, onscene at an activity that they are shown enroute to.

Command: **OS ,*comments***

Where: ,***comments*** is any additional comments the unit may want entered into the Unit History.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Unit status is updated, history segments are written to the Unit and Incident Histories.
If Unit has not been dispatched to an incident….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric, characters.
"*1102* Onscene at #DIV*101000001*" – normal response with 9 digit incident number.
"*1102* Not Currently Enroute" – if unit is not shown as dispatched or enroute to an activity in CAD.
"*1102* Already Onscene" - if unit has already marked onscene.

4.8 CL (Change Location) Command

Purpose: To indicate that the mobile user has left the current location of the assigned incident and is enroute to another location.

Command: **CL ^ [new location] ,*comments***

Where: **[new location]** is the new location the mobile user is enroute to.
Field length – Maximum 39 alphanumeric characters. Example: 123 Main St.
Field delimiters – [(ASCII x5B) at the beginning and] (ASCII x5D) at end.
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Unit status is updated, history segments are written to the Unit and Incident Histories.
Response sent to mobile user and dispatcher.
If Unit has not been dispatched to an incident or activity….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Unit *1102* Enroute to New Location*: 123 Main St.* (#DIV*101000001*)" – if command executes successfully.
"Unit *1102* is not Assigned or Out of Service" – if unit is not shown as dispatched or enroute to an incident or activity in CAD.

4.9 TR (Transport) Command

Purpose: To indicate that the Unit currently assigned to an incident or activity is transporting a subject.

Command: **TR ^ *[new location] ,comments***

Where: ***[new location]*** is the new location the Unit is transporting a subject to. If ***new location*** is not provided, the CAD system will default the location to "Magistrate".
Field length – Maximum 39 alphanumeric characters. Example: 123 Main St.
Field delimiters – **[** (ASCII x5B) at the beginning and **]** (ASCII x5D) at end.
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories. Comments should include beginning mileage if subject being transported is the opposite sex.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Unit status is updated, history segment is written to the Unit and Incident Histories.
Response sent to mobile user and dispatcher.
If Unit has not been dispatched to an incident or activity….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Unit *1102* Transporting to *123 Main St.* (#DIV*101000001*)" – if command executes successfully.
"Unit *1102* is not Assigned or Out of Service" – if unit is not shown as dispatched to an incident or activity in CAD.

4.10 TRC (Transport Complete) Command

Purpose: To indicate that the Unit has completed a transport.

Command: **TRC ^ *[new location] ,comments***

Where: ***[new location]*** is the new location the Unit has transported the subject to. If no location is given, the CAD system will default the location to the location supplied with the Transport Command.
Field length – Maximum 39 alphanumeric characters. Example: 123 Main St.
Field delimiters – [(ASCII x5B) at the beginning and] (ASCII x5D) at end.
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories. Comments should include ending mileage if subject being transported is the opposite sex.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Unit status is updated, history segments are written to the Unit and Incident Histories.
Response sent to mobile user and dispatcher.
If Unit has not been dispatched to an incident or activity….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Unit *1102* Transport Complete at *123 Main St.* (#DIV*101000001*)" – if command executes successfully.
"Unit *1102* is not Assigned or Out of Service" – if unit is not shown as dispatched to an incident or activity in CAD.

4.11 TOW (Rotational Wrecker Request) Command

Purpose: To send a request for the next rotational wrecker at the scene of the mobile user's assigned incident.

Command: **TOW ^ W/zone ,*comments***

Where: **W/zone** is the rotational wrecker zone the mobile user needs a wrecker from.
Field length – Maximum 4 numeric characters. Example: 441
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories. Comments should include any vehicle or service information the mobile user may need to pass on to the wrecker service.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Request is sent to controlling dispatcher with the next recommended wrecker information.
History segment is written to the Unit and Incident Histories.
Response sent to mobile and dispatcher.
If Unit has not been dispatched to an incident or activity….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Tow Request Received for *1102* (#DIV*101000001*)" – if command executes successfully.
"Unit *1102* must be assigned to an Incident to request a TOW" – if unit is not shown as dispatched to an incident or activity in CAD.

4.12 TOWL (Rotational Large Wrecker Request) Command

Purpose: To send a request for the next large (heavy-duty) rotational wrecker at the scene of the mobile user's assigned incident.

Command: **TOWL ^ W/zone ,*comments***

Where: **W/zone** is the rotational wrecker zone for which the mobile user needs a large wrecker.
Field length – Maximum 4 numeric characters. Example: 441
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories. Comments should include any vehicle or service information the mobile user may need to pass on to the wrecker service.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit has been dispatched to an incident….
Request is sent to controlling dispatcher with the next recommended wrecker information.
History segment is written to the Unit and Incident Histories.
Response sent to mobile user and dispatcher.
If Unit has not been dispatched to an incident or activity….
Error message is sent to the mobile user.

Responses: Maximum length – 78 alphanumeric characters.
"Tow Request Received for *1102* (#DIV*101000001*)" – if command executes successfully.
"Unit *1102* must be assigned to an Incident to request a TOW" – if unit is not shown as dispatched to an incident or activity in CAD.

4.13 GD (Give Disposition) Command

Purpose: To record disposition information for an incident from the primary unit when a summons or arrest has been affected.

Command: **GD ^ #*incident number* ^ D/disposition . *disposition* . *disposition* . *disposition* ^ L/legal code . *legal code* . *legal code* . *legal code* ^ V/vehicle code . *vehicle code* . *vehicle code* . *vehicle code* ^ I/interstate ,*comments***

Where: **#*incident number*** is the incident to which **disposition**(s) is to be applied. Only required if the Unit is not currently assigned to the incident.
Field length – Maximum 12 alphabetic/numeric characters, preceded by the # sign (ASCII x23). Example: #DIV101000001

D/disposition is a valid disposition code when a summons or arrest is made. Up to 4 codes, separated by periods (ASCII x2E), can be entered per command.
Field length – Maximum 3 alphabetic/numeric characters. Example: ART

L/legal code is a valid section number for the applicable Code of Virginia statute. There must be a corresponding **legal code** provided for each **disposition code** given.
Field length – Maximum 13 alphanumeric characters including periods (ASCII x2E) and dashes (ASCII x2D). Example: 46.2-1993.117

V/vehicle code is a valid vehicle type-code. Vehicle codes may only apply to certain disposition types. However, there must be a corresponding **vehicle code** provided for each **disposition code** given.
Field length – Maximum 1 alpha character, either "P" (ASCII x50) for passenger or "C" (ASCII x43) for commercial vehicle or "N" (ASCII x4E) for not applicable.

I/interstate is a road type indicator for where the incident occurred. "Y" for Interstate or "N" for non-Interstate highway.
Field length – Maximum 1 alpha character, either "Y" (ASCII x59) or "N" (ASCII x4E)

,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If Unit is currently the primary on an incident or, #***incident number*** is provided and Unit was primary….
Records the given disposition information to the Incident History.
Returns response message to mobile user.
If Unit is not currently the primary on an incident and #***incident number*** is provided but Unit was not the primary….
Records information in the Unit History.
Error message is sent to the mobile user.
If Unit is not assigned to an incident and #***incident number*** was not provided….
Error message is sent to the mobile user.
All information will be recorded in the Unit History.

Responses: Maximum length – 78 alphanumeric characters.
"#DIV*101000001* given disposition of UTS.ART" – successful response message may include up to 4 disposition codes.
"Unit not assigned to incident" – if unit is not currently assigned as primary unit to an incident and #***incident number*** was not furnished.

4.14 TSS (Traffic Stop Summary) Command

Purpose: To provide statistical information about arrests and searches as a result of a traffic stop.

Command: **TSS ^ J/jurisdiction ^ RAC/race ^ TA/traffic arrest ^ AA/aerial arrest ^ AS/arrest search ^ SS/stop search**

Where: **J/jurisdiction code** is the numeric code assigned to the jurisdiction in which the traffic stop occurred.
Field length – Required 3 numeric characters. Example: 043
RAC/race is the VSP assigned code for the race of the traffic stop subject.
Field length – Required **W**hite, **B**lack, **H**ispanic, **A**sian, **I**ndian, **O**ther, or **U**nknown single alpha character.
TA/traffic arrest is an indicator to signify whether the traffic stop resulted in an arrest.
Field length – Required **Y**es or **N**o (ASCII x59 or x4E) alpha character.
AA/aerial arrest is an indicator to signify whether the traffic stop arrest was as a result of aerial speed enforcement.
Field length – Required **Y**es or **N**o **(**ASCII x59 or x4E) alpha character.
AS/arrest search is an indicator to signify whether a search was conducted in conjunction with an arrest.
Field length – Required **Y**es or **N**o (ASCII x59 or x4E) alpha character.
SS/stop search is an indicator to specify whether a search was conducted in conjunction with the traffic stop only.
Field length – Required **Y**es or **N**o (ASCII x59 or x4E) alpha character.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If the unit is currently assigned to a traffic stop incident….
Information provided is recorded within the CAD system for periodic transfer to the MIS system.
Enables an incident closing **C**lear command from the primary unit assigned to the traffic stop.
If the unit is not assigned to a traffic stop incident or is not the primary unit….
Error message is returned to the issuing unit.

Responses: Maximum length – 78 alphanumeric characters.
"Incident #DIV*101000001* summary accepted" – if command is successful. Response is sent to mobile user and controlling dispatcher.
"Summary not accepted (unassigned unit)" – if command is unsuccessful because the unit is not currently assigned to a traffic stop incident. Response is sent to mobile user and controlling dispatcher.
"Summary not accepted (secondary unit)" – if command is unsuccessful because the unit is assigned as secondary to the traffic stop incident. Response is sent to mobile user and controlling dispatcher.

4.15 C (Clear) Command

Purpose: To clear a mobile user from an incident or activity.

Command: **C ^ *D/disposition . disposition . disposition . disposition ,comments***

Where: ***D/disposition*** are the unit's incident disposition codes. At least one code is **required** if no disposition codes have been given with a **GD** command, the incident/activity type requires a disposition, and the unit is the primary assigned. Up to four codes, separated by periods (ASCII x2E), can be provided but none can be any for which a legal code is required.
Field length – Maximum 3 alphabetic characters. Example: WUS
,***comments*** is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If the unit is primary on an incident or activity….
If required disposition information is not provided or is incorrect, an error message is returned to the mobile user.
If required disposition information is provided or has been previously provided with the GD command the Unit and Incident Histories are updated and the Unit's Status is changed to Available. Response message is sent to the mobile user and controlling dispatcher.
If the unit is assigned to an incident or activity but is not primary….
Unit and Incident Histories are updated to show Unit cleared from the incident. Any disposition information provided is written to the Unit History only. Unit Status is changed to Available and response is sent to mobile user and controlling dispatcher.

Responses: Maximum length – 78 alphanumeric characters.
"Unit *1102* cleared at *11:00* from #DIV*101000001*" – if command is successful and other units are still assigned to the incident or activity. Response is sent to mobile user and controlling dispatcher.
"Unit *1102* cleared at *11:00* from #DIV*101000001* (Closed)" – if command is successful and the unit is the last to clear. Response is sent to mobile user and controlling dispatcher.
"Must enter disposition when clearing Primary Unit" – if required disposition information has not been provided or is incorrect. Response is sent to mobile user.
"Unit *1102* back in service at *11:00*" – if Unit is assigned to a non-incident generating activity such as "Meal". Message is sent to controlling dispatcher and mobile user.
"Unit *1102* cannot clear from #DIV*101000001* (TSS required)" – if command is sent by the primary unit assigned to a traffic stop incident but a **TSS** command has not been issued.

4.16 OUT(*E*) (Out of Service Onscene or *Enroute*) Command

Purpose: To place a mobile user out of service onscene, or enroute to, an incident or activity.

Command: **OUT*E* ^ T/type code ^ *[location]* ^ *license* ^*@license state* ^ *license year* ^ *license type* *,comments***

Where: **OUT** command will be used to indicate the mobile user is out on the scene of an incident or activity such as a traffic stop.
OUTE command will be used to indicate the mobile user is enroute to an incident or activity such a call received from a local agency.
T/type code is an incident or activity type code defined in the CAD system.
Field length – Maximum 6 alphabetic/numeric characters.
[location] is the location of the activity or incident. Not required for all types.
Field length – Maximum 39 alphanumeric characters.
Field delimiters - Must begin with **[** (ASCII x5B)and end with **]** (ASCII x5D).
@license is the license plate number the mobile user wants run in association with this activity. The number must be preceded by the @ sign (ASCII x40).
Field length – Maximum 8 alphabetic/numeric characters. Example: @ABC123
license state is the license plate issuing state. If left blank and ***license*** is sent with the command, ***license state*** will default to VA.
Field length – Maximum 2 alphabetic characters.
license* year** is the year of registration expiration. If left blank and ***license is sent with the command, ***license year*** will default to current year.
Field length – Maximum 4 numeric characters. Example: 2001
license type is the type code[7] of vehicle license. If left blank and ***@license*** is included with the command, ***license type*** will default to PC.
Field length – Maximum 2 alphabetic characters. Example: PC
,comments is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

[7]License plate Type Codes are defined in the NCIC Code Manual.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD. If license information is provided, the CAD Message Switch will format the query and send it to VCIN and to CAD for recording the registration request in the appropriate history files.
CAD
If the type code indicates this should generate an incident, CAD will create the incident. A message will be sent to the dispatcher that the mobile user is out on an incident or activity. A message for location verification will also be sent to the dispatcher if the location does not verify in the CAD geographical information file. All information is recorded in the Unit and Incident Histories.

Responses: **From CAD** – Maximum length 78 alphanumeric characters.
"Unit *1102* Out-of-Service Enroute to *location*" – if the **OUTE** command is used and **type code** requires an incident be created. Message is sent to mobile user and controlling dispatcher.
"Unit *1102* Out-of-Service Onscene at *location*" – if the **OUT** command is used and **type code** requires an incident be created. Message is sent to mobile user and controlling dispatcher.
"Unit *1102* Out-of-Service Enroute" – if the **OUTE** command is used and **type code** is an activity. Message is sent to mobile user and controlling dispatcher.
"Unit *1102* Out-of-Service Onscene" – if the **OUT** command is used and **type code** is an activity. Message is sent to mobile user and controlling dispatcher.
"Location Not Entered" – if **type code** requires a location and ***location*** is not entered. Error message is sent to mobile user.
"Incident Type/Out Code is Invalid" - if **type code** is not a valid code in the CAD system. Error message is sent to the mobile user.
From VCIN – Alphanumeric messages of unspecified length.
If ***license*** was submitted, the CAD Message Switch will format and the run the VCIN query or, queries if ***license state*** is not VA. Responses may include VCIN wanted, NCIC wanted, VA or other state vehicle ownership information.

4.17 CN (Case Number) Command

Purpose: To request a SP-102 case number.

Command: **CN ^ #*incident number* ^ $/division area ^ O/offense code ,*comments***

Where: **#*incident number*** is only required if the mobile user is not currently assigned to the incident the case number is being requested for.
Field length – 12 alphabetic/numeric characters, preceded by the # sign (ACII x23).
Example: #DIV101000001
$/division area is the Virginia State Police Division and the area.
Field length – Required 4 numeric characters. Example: 2101
O/offense code is the Virginia State Police defined offense code.
Field length – Required 4 numeric characters. Example: 1401
,comments is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
If the Unit has been dispatched to an incident or ***incident number*** is provided….
History segments are written to the Unit and Incident Histories.
Case number will be issued.
Response sent to mobile user.
If the Unit has not been dispatched to an incident or ***incident number*** is not provided….
Error message is sent to mobile user.

Responses: Maximum length 78 alphanumeric characters.
"Case Number $*0121011234* Assigned to #DIV*101000001*" - if command executes successfully. Message is sent to mobile user.
"Unit is not currently assigned to an incident" – if mobile user is not shown as dispatched to an incident in CAD and ***incident number*** is not sent. Message is sent to mobile user.
"Offense code required for SP-102 Case Numbers" – if **offense code** is not sent. Message is sent to mobile user.
"A Case Number Series is required" – if **division area** is not sent. Error message is sent to mobile user.

4.18 UH (Unit History) Command

Purpose: To request a Unit History.

Command: **UH ^ *date^***

Where: ***date*** is the date of the unit history requested. If not provided CAD will default to the most current unit history.
Field length – Required 6 numeric characters. Example: 030601

Actions: **CAD Message Switch**
Forwards command message to the appropriate Division CAD.
CAD
Requested Unit History will be returned to the mobile user in the response message.

Responses: Alphanumeric indefinite length.
Refer to Appendix A for a typical Unit History response.

4.19 IH (Incident History) Command

Purpose: To request an Incident History.

Command: **IH ^ #*incident number***

Where: **#*incident number*** is the incident number of the incident history desired. If not provided CAD will default to the current or last incident the Unit was assigned to.
Field length – 12 alphabetic/numeric characters preceded by the # sign (ASCII x23).
Example: #DIV101000001

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
Requested Incident History will be returned to mobile user.

Responses: Alphanumeric indefinite length.
Refer to Appendix A for a typical Incident History response.

4.20 UR (Unit Roster) Command

Purpose: To request a Unit Roster.

Command: **UR ^ *dispatch group***

Where: ***dispatch group*** is the dispatch group the roster is being requested for. If this is not provided CAD will default to mobile user's home CAD group.
Field length – Maximum 5 alphanumeric characters beginning with "G" (ASCII x47).
Example: G101.

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
Requested Unit Roster will be returned to mobile user in a response message.

Responses: Alphanumeric indefinite length.
Refer to Appendix A for a typical Unit Roster response.

4.21 US (Unit Status) Command

Purpose: To request a Unit Status list.

Command: **US ^ *dispatch group*** or ***unit number*** or ***All***

Where: **Note: Only one of these parameters may be sent.**
dispatch group is the dispatch group the status list is being requested for. If this is not provided CAD will default to mobile user's home group.
Field length – Maximum 5 alphabetic/numeric characters beginning with "G" (ASCII x47). Example: G101.
unit number is the unit number the status list is being requested for. If this is not provided CAD will default to all units mobile user's home group.
Field length – Maximum 5 alphabetic/numeric characters. Example: 1102
ALL indicates that a status list is being requested for all units in the mobile user's home CAD.

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
Requested Unit Status will be returned to mobile user in a response message.

Responses: Alphanumeric indefinite length.
Refer to Appendix A for a typical Unit Status response.

4.22 D or A (Dispatch or Assist) Incoming Command

Purpose: These command messages are sent to the mobile user when a dispatcher issues the CAD command to dispatch the Unit to a call as either the primary or the assisting unit.

Command: **D ^ primary unit ^ *assisting unit ^ assisting unit ^ assisting unit ,comments***
or:
A ^ assigned unit ^ assisting unit ,*comments*

Where: **D -** indicates that this message is Dispatching the unit(s) to the incident and….
primary unit is the badge number of the primary unit being dispatched to the incident.
Field length – Maximum 5 alphabetic/numeric characters. Example: 1442
assisting unit are the badge numbers of assisting units being dispatched to the incident.
Field length – Maximum 5 alphabetic/numeric characters. Example: 988
,*comments* is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

A - indicates that this message is dispatching additional units to Assist the incident primary unit and….
assigned unit is the badge number of the primary unit assigned to the incident.
Field length – Maximum 5 alphabetic/numeric characters. Example: 1442
assisting unit is the badge number of the unit being dispatched to assist.
Field length – Maximum 5 alphabetic/numeric characters. Example: 988
,*comments* is any additional comments the unit may want entered into the Unit and Incident Histories.
Field length – Maximum 78 alphanumeric characters.

Actions: **CAD Message Switch**
CAD Message switch will receive the command message from the CAD system and forward it to all specified mobile users.
CAD
Status change will be indicated for all units listed in the command.
Timer will be set to notify the dispatcher if the mobile user does not mark enroute to the call within a specified amount of time based on the settings in the Type file.

Responses: Alphanumeric text message of indefinite length.
The response Message is sent to the mobile user will include all incident history data entered to the time the dispatch or assist command is sent. The message will be formatted as follows:

Line 1 – **DISPATCHED**
Line 2 – A list of all units currently dispatched to the call, in numeric order with tic marks to indicate primary unit. Up to four units per line.
Example: **1442' +1617 392**
All other information will move down one line as needed. One blank line will follow the last line needed to display the units.
Line 3 – blank
Line 4 – incident number incident priority incident type dispatch group duty post
Example: **#Div101000168 1/1055 G/G101 /010101A**
Line 5 – Incident location ,jurisdiction code
Example: **NB 95 at 89mm ,042**
Line 6 – Blank
Line 7 – Explanation of incident type
Example: **INTOXICATED DRIVER**
Line 8 – Further location information if available
Example: **On right shoulder**
Line 9 – phone number,name,address of reporting party
Example: **8045551212,MR BROWN,124 MAIN STREET**
Line 10 –Blank
Line 11 through the last line - Incident history segments displayed as follows:
Entry Segment - /HHMM ENTRY details
Example: **/0940 ENTRY BLUE HONDA 2 OCCUPANTS**
Additional segments: /HHMM segment type unit segment details
Examples: **/0945 DISP 1102 #3037 BARKER,TPR DAVE V**
/0945 ASSTER 392 #3649 STILES,SGT KERRY L
/0946 CLEAR 1442
/1001 MISC ,VEHICLE PARTIALLY BLOCKING THE ROAD

4.23 TO (Terminal to Terminal Text Message) Command

Purpose: To send a text message to another MCT connected to the CAD Message Switch or any other CAD terminal.

Command: **TO/dest1 , *dest2 , dest3 , dest4 , dest5* /message text**

Where: **dest1** is the destination terminal identifier for **message text**. At least one destination is required. This can be any MCT user connected to the CAD Message Switch or any CAD terminal, such as a dispatch or area office terminal.
Field length – Maximum 5 alphabetic/numeric characters. Example: D101
dest2 through ***dest5*** are addition destinations separated by commas.
Field length – Maximum 5 alphabetic/numeric characters per destination.
Example: 1102,D101,A101,D105
/**message text** is the text to be sent. Must be preceded by a / symbol- (ASCII x2F).

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
Requested Unit Status will be returned to mobile user in a response message.

Responses: Alphanumeric indefinite length.

4.24 CI (Court Information) Command

Purpose: To allow a mobile user to enter, update, retrieve, and delete court disposition information by date.

Command: **CI ^ action code ^ date1 ^** ***date2 ^ J/jurisdiction code ^ CD/dui convictions ^ CO/other convictions ^ DD/dismissed dui ^ DO/dismissed other ^ ND/nolle dui ^ NO/nolle other ^ LO/complied***

Where: **action code** is the function the mobile user wants to execute. Action codes are "I" for insert, "U" for update, "R" for retrieve, "D" for delete.[8].
date1 is the date of the disposition information entry.
Field length – Required 6 numeric characters. Example: 030801
date2 is the ending date of a date range. Used only when retrieving a range of disposition information[9].
Field length – Required 6 numeric characters. Example: 030801
J/ jurisdiction code [10] is the court's jurisdiction code.
Field length – Required 3 numeric characters. Example: 043

Note: - At least one of the following information field designations is **required** for **I**nsert and **U**pdate functions.

CD/ dui convictions is the total number of DUI convictions not appealed.
Field length – Maximum 3 numeric characters. Example: CD/132
CO/ other convictions is the total number of other convictions not appealed.
Field length – Maximum 3 numeric characters. Example: CO/132
DD/ dismissed dui is the total number of dismissed DUI cases.
Field length – Maximum 3 numeric characters. Example: DD/132
DO/ dismissed other is the total number of other dismissed cases.
Field length – Maximum 3 numeric characters. Example: DO/132
ND/ nolle dui the total number of nol-prossed DUI cases.
Field length – Maximum 3 numeric characters. Example: ND/11
NO/ nolle other is the total number of nol-prossed other cases
Field length – Maximum 3 numeric characters. Example: NO/11
LO/ complied is the total number of cases which complied with the law.
Field length – Maximum 3 numeric characters. Example: LO/11

[8] A single disposition file entry must be **R**etrieved prior to **D**eleting it.
[9] If ***jurisdiction code*** is provided, only disposition file entries for ***jurisdiction code*** within the date range specified will be retrieved. If ***jurisdiction code*** is not provided, all entries within the date range will be retrieved.
[10] ***jurisdiction code*** is required for **I**nsert and **U**pdate functions.

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
For **action code** –
Insert - adds new information record in the Court Information file.
Update - modifies an existing information record in the Court Information file.
Retrieve - requested information from the Court Information file.
Delete – removes an existing information record from the Court Information file.

A unit history segment will be added for each **I**nsert, **U**pdate, and **D**elete function.
Court Disposition Information file information will be transfer to MIS nightly.

Responses: Response messages returned to the mobile user will depend on **action code**.
Insert –
"Record Already Exists" - if court information for that date and jurisdiction already exists.
"Record Inserted" - if Insert function is successful.
Update –
"No Record Found" - if a record with **date1** and ***jurisdiction code*** is not found.
"Record Updated" - if a record with **date1** and ***jurisdiction code*** is found and successfully updated.
Retrieve –
If ***jurisdiction code*** is not provided, values from all records within the date range will be totaled and a message is returned in the following format:
Line 1 – **Court Disposition for Badge for date1 date2**

Line 2 –	**DUI**	**/ OTHER**
Line 3 – **Convicted, not appealed**	***102***	***10***
Line 4 – **Dismissed**	***10***	***8***
Line 5 – **Nolle Prossed**	***4***	***2***
Line 6 – **Complied With Law**		***1***
Line 7 – **TOTALS**	***116***	***21***

If ***jurisdiction code*** is provided, only the information for that jurisdiction, for that date or date range, will be sent.
"No Record Found" - - if a record with **date1** and ***jurisdiction code*** is not found.
Delete -
"Record Deleted" - if the record is deleted successfully.
Delete by date range will not be allowed.

4.25 AI (Agencies Assisted) Command

Purpose: To allow a mobile user to enter, update, retrieve, and delete Agencies Assisted Information by date.

Command: **AI ^ action code ^ date1 ^ *date2* ^ *SO/ aso* ^ *PD/apd* ^ *O/aoa***

Where: **action code** is the action the mobile user wants to execute. Action codes are **"I"** for insert, **"U"** for update, **"R"** for retrieve, **"D"** for delete.
date1 is the date, or range starting date, of the assist information. Used when inserting, updating, retrieving a single record, or deleting.
Field length – Required 6 numeric characters. Example: 030801
date2 is the ending date for a range of assist information. Used only when retrieving a range of records. All records within the range specified will be retrieved.
Field length – Required 6 alphabetic/numeric characters. Example: 030801

Note: - At least one of the following information field designations is **required** for **I**nsert and **U**pdate functions.

SO/aso is the number of times assistance was given to sheriff's office personnel.
Field length – Maximum 3 numeric characters. Example: SO/12
PD/apd is the number of times assistance was given to police department personnel.
Field length – Maximum 3 numeric characters. Example: PD/4
***O/*aoa** is the number of times assistance was given to other agency personnel.
Field length – Maximum 3 numeric characters. Example: O/6

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
For **action code** –
Insert - adds new information record in the Agency Assist Information file.
Update - modifies an existing record in the Agency Assist Information file.
Retrieve – returns information record(s) from the Agency Assist Information file.
Delete – removes an existing record from the Agency Assist Information file.

A unit history segment will be added for each **I**nsert, **U**pdate, and **D**elete function.
Agency Assist Information file information will be transfer to MIS nightly.

Responses: Response messages returned to the mobile user will depend on **action code**.
Insert –
"Record Already Exists" - if an information record for **date1** already exists.
"Record Inserted" - if new information record is inserted is successfully.
Update –
"No Record Found" - if a record for **date1** is not found.
"Record Updated" - if a record for **date1** is found and updated successfully.
Retrieve –
If a record for **date1** is found, requested information fields will be returned.

If a date range is supplied, values from all records within that date range will be totaled and a message is returned in the following format:

Line 1 –	**Agencies Assisted for Badge for date1 date2**	
Line 2 –	**Sheriff Dept.**	***10***
Line 3 –	**Local PD's**	***10***
Line 4 –	**Other**	**4**
Line 5 –	**TOTAL**	**24**

"No Record Found" - if a record for **date1** is not found.
Delete –
"Record Deleted" - if retrieved record is deleted successfully.
Delete by date range will not be allowed.

4.26 DI (Drug / Narcotics Information) Command

Purpose: To allow a mobile user to enter, update, retrieve, and delete drug/narcotics information by date.

Command: **DI ^ action code ^ date1 ^ *date2 ^ A/arrests ^ D/distributions ^ P/possessions ^ O/other ^ V/street value ^ C/currency ^ W/weapons***

Where: **action code** is the action the mobile user wants to execute. Action codes are **"I"** for insert, **"U"** for update, **"R"** for retrieve, **"D"** for delete.
date1 is the date, or range starting date, of the assist information. Used when inserting, updating, retrieving a single record, or deleting.
Field length – Required 6 numeric characters. Example: 030801
date2 is the ending date for a range of assist information. Used only when retrieving a range of records. All records within the range specified will be retrieved.
Field length – Required 6 alphabetic/numeric characters. Example: 030801

Note: - At least one of the following information field designations is **required** for **I**nsert and **U**pdate functions.

A/arrests is the number of persons arrested.
Field length – 3 numeric characters: Example: A/12
D/distributions is the number of distribution charges placed**.**
Field length – 3 numeric characters. Example: D/4
P/possessions is the number of possession charges placed.
Field length – 3 numeric characters. Example: P/6
O/other is the number of other drug related charges placed.
Field length – 3 numeric characters. Example: O/2
V/street value is the estimated value of drugs seized in whole dollars.
Field length – 7 numeric characters. Example: V/1123123
C/currency is the amount of currency seized in whole dollars.
Field length – 7 numeric characters. Example: C/1123123
W/weapons is the number of weapons seized.
Field length – 3 numeric characters. Example: W/14

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
For **action code** –
Insert - new information record is added to the Drug/Narcotics Information file.
Update – an existing record in the Drug/Narcotics Information file is modified.
Retrieve – requested information records(s) from the Drug/Narcotics Information file are returned.
Delete – removes an existing record from the Drug/Narcotics Information file.

A unit history segment will be added for each **I**nsert, **U**pdate, and **D**elete function.
Drug/Narcotics Information file information will be transfer to MIS nightly.

Responses: Response messages returned to the mobile user will depend on **action code**.
Insert –
"Record Already Exists" - if an information record for **date1** already exists.
"Record Inserted" - if the new information record is inserted successfully.
Update –
"No Record Found" - if a record for **date1** is not found.
"Record Updated" - if a record for **date1** is found and updated successfully.
Retrieve –
If a record for **date1** is found, requested information fields will be returned.

If a date range is supplied, values from all records within that date range will be totaled and a message is returned in the following format:
Line 1 – **Drug/Narcotics Information for Badge for date1 date2**
Line 2 – **Persons Arrested 10**
Line 3 – **Distribution Charges 10**
Line 4 – **Possession Charges 4**
Line 5 – **All Other Charges 3**
Line 6 – **Street Value Seized $ 1,100**
Line 7 – **Currency Seized $ 5,000**
Line 8 – **Weapons Seized 10**
"No Record Found" - if a record for **date1** is not found.
Delete –
"Record Deleted" - if retrieved record is deleted successfully.
Delete by date range will not be allowed.

4.27 MI (Mileage Information) Command

Purpose: To allow a mobile user to retrieve and update car mileage information by date or date range.

Command: **MI ^ action code ^ date1 ^ *date2* ^ *BM/beginning mileage* ^ *EM/ending mileage***

Where: **action code** is the action the mobile user wants to execute. Action codes are **"U"** for update, **"R"** for retrieve.
date1 is the date, or range starting date, of the mileage information.
Field length – Required 6 numeric characters. Example: 030801
date2 is the ending date for a range of mileage information. Used only when retrieving a range of records. All records within the range specified will be retrieved.
Field length – Required 6 alphabetic/numeric characters. Example: 030801
BM/beginning mileage only used when updating an existing record.
Field length – Maximum 6 numeric characters: Example: BM/127308
EM/ending mileage only used when updating an existing record.
Field length – Maximum 6 numeric characters. Example: EM/128410

Actions: **CAD Message Switch**
Forwards the command message to the appropriate Division CAD.
CAD
For **action code** -
Update - modifies existing mileage information.
Retrieve - returns the requested mileage information.
A unit history segment will be added for each **U**pdate function.

Responses: Response messages returned to the mobile user will depend on **action code**.
Update –
"No Record Found" - if a record for **date1** is not found.
"Record Updated" - if a record for **date1** is found and updated successfully.
Retrieve –
"No Record Found" - if a record for **date1** is not found.
If a record for **date1** is found, requested information fields will be returned.

If a date range is supplied, values from all records within that date range will be totaled and a message is returned in the following format:

Line 1 – **Mileage Information for Badge for date1-date2**				
Line 2 –	**Date**	**Beginning Mileage**	**Ending Mileage**	**Total**
Line 3 –	**030101**	**54,000**	**54,365**	**365**

5.0 VCIN Query Commands

VCIN query commands supported by the MCT Command Interface are defined in this section. All VCIN query command sequences are originated by the MCT user. The message command-code and data elements provide the CAD Message Switch with a query Function and search Criteria. The CAD Message Switch will transform these commands into valid Inquiry messages and forward them to VCIN. The mobile user is responsible for understanding the specific requirements of each Inquiry type, with respect to Criteria content and format.

In addition to the command-initiated inquiries, a freeform query capability is also supported. Freeform query messages will be recognized and forwarded directly to VCIN, as is, without validation by the CAD Message Switch. Syntax error checking will be performed by either VCIN or subsequent systems. The command format of the freeform query is described at the end of this section.

With the exception of inquiries from users for whom the VSP CAD system does not maintain a history file, all inquiry messages forwarded to VCIN are copied to the appropriate Division CAD. The involvement of the Division CAD is only to record appropriate history file segments with the inquiry message, as content. No response to this action will be returned to the mobile user by the Division CAD system. VCIN response messages for a given query will vary in number, length, and order of transmission. Depending on the query type, a separate, and information specific, response may be generated by multiple systems. Because the CAD Message Switch will forward response messages on a first received, first sent basis, the order of receipt at the mobile system may be indeterminate.

The initial response returned to the mobile user, for all queries successfully sent to VCIN, will be **"ACCEPTED"**. The mobile user will then know that VCIN has accepted the query for processing. The CAD Message Switch will examine VCIN inquiry response messages for Wanted/Stolen indicators. If either status is indicated and where applicable, a copy of the response message will be sent to the mobile user's Division CAD to alert their controlling dispatcher. Due to the magnitude of possible responses, definitions for these message formats will not be provided by this document. The mobile system should accommodate the storage and

display of multiple, 80 characters per line by an indeterminate number of lines, response messages. The maximum data character length of a response message is 14,700 bytes[11].

The ensuing tables define the purpose, format, data elements, and system actions for each query command. Data element descriptions include the field length, data type and in some cases, an example. Conventions used in the query command description tables are as following:

- Query command codes are displayed in **UPPERCASE, BOLD, BLOCK** font.
  Example: **QA**
- The ^ symbol within a command string indicates a required Space (ASCII x20).
  Example: **QG^**……..
- Required data element designators are designated by **UPPERCASE, BOLD, BLOCK** font.
  Example: **QG ^ SER/**……..
- Required data element variables are displayed in **lowercase, bold, block** font.
  Example: **QG ^ SER/serial number**
- Optional data element designators are indicated by ***UPPERCASE, BOLD, ITALICISED*** font.
  Example: **QG ^ SER/serial number ^** ***CAL/***……
- Optional data element variables are displayed in ***lowercase, bold, italicized*** font.
  Example: **QG ^ SER/serial number ^** ***CAL/caliber***
- Fixed length fields are specified by stating the required number of characters.
  Example: Field length – Required 8 numeric characters.
- Variable length fields are specified in maximum number of characters.
  Example: Field length – Maximum 7 alphabetic/numeric characters.
- Variable length field minimum character requirements will follow the maximum number.
  Example: Field length – Maximum 7 minimum 4 alphabetic/numeric characters.

5.1 QA (Query Article) Command

Purpose: To spawn a query of the NCIC Article File for stolen, recovered, or lost articles.

Command: **QA ^ TYP/article type[12] ^ SER/serial number**

Where: **TYP/article type** – is an Article Type Code from the NCIC 2000 Article Name Dictionary.
Field length – Maximum 7, minimum 4 alphabetic characters. Example: DCOMPUT
SER/serial number – is the serial number of the article.
Field length - Maximum 20 alphabetic/numeric characters. Example: ABC1234DE5677

Actions: **CAD Message Switch**
Formats the query message and sends it to VCIN.
Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.
CAD
Creates a Unit History segment containing the query message. An Incident History segment is also written if the unit is currently assigned.

Responses: Alphanumeric text message of indefinite length.

[11] 14,700 bytes is derived from the NLETS specified maximum message length.
[12] The Article Type field may be omitted only if the inquiry is for a Virginia, Vehicle Inspection sticker. The CAD Message Switch will default **article type** to **"JSTICKE"** if message field code **TYP/** is not provided.

5.2 QG (Query Gun) Command

Purpose: To spawn a query of the NCIC Gun File for stolen, recovered or lost guns.

Command: **QG ^ SER/serial number ^ *MAK/make ^ CAL/caliber ^ MOD/model***

Where: **SER/serial number** – is the serial number of the gun.
Field length - Maximum 11 alphabetic/numeric characters.
Example: R7102733487
MAK/make – is the NCIC Gun Data Code for the gun manufacturer.
Field length – Maximum 23 minimum 2 alphabetic/numeric characters.
Example: REM
CAL/caliber – is a NCIC Gun Data Code for the gun cartridge type.
Field length – Maximum 4 numeric characters. Example: 270
MOD/model – is the manufacture's model designation.
Field length – Maximum 11 alphabetic/numeric characters with intervening spaces.
Example: Model 710

Actions: **CAD Message Switch**
Formats the query message and sends it to VCIN.
Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.
CAD
Creates a Unit History segment containing the query message. An Incident History segment is also written if the unit is currently assigned.

Responses: Alphanumeric text message of indefinite length.

5.3 QB (Query Boat) Command

Purpose: To spawn a query of NCIC and various state agency Boat Files for stolen, recovered or lost and registration information.

Command: **QB ^ REG/registration number ^ BHN/hull number ^ *VMA/make ^ SOC/owner ssn***

Where: Note: - Inquiries may include **REG/** and/or **BHN/**

REG/registration number – is the boat registration number including state code.
Field length - Required 8 alphabetic/numeric characters without spaces.
Example: FL1342YB
BHN/hull number – is the Hull Identification Number assigned by the manufacturer.
Field length – Maximum 20 alphabetic/numeric characters.
Example: SERCB1234E901
VMA/make – is the NCIC Boat Data Code for the boat manufacturer.
Field length – Maximum 4 minimum 2 alphabetic/numeric characters.
Example: SER
SOC/owner ssn – is the Social Security Number of the boat owner.
Field length – Required 9 numeric characters.

Actions: **CAD Message Switch**

Formats various VCIN query message(s) based on the **required** elements provided….

If **registration number** is provided, queries are generated for NCIC and, Virginia Department of Game and Inland Fisheries (DGIF) or indicated out-of-state.

If **hull number** is provided, queries are generated for NCIC, Virginia DGIF and, if **registration number** is provided, for indicated out-of-state.

Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.

CAD

Creates a Unit History segment containing the query message. An Incident History segment is also written if the unit is currently assigned.

Responses: Alphanumeric text message of indefinite length.

5.4 QV (Query Vehicle) Command

Purpose: To spawn various queries of NCIC, VCIN and/or, Virginia DMV or out-of state files for registration and lien, stolen vehicle, and wanted/missing persons information.

Command: **QV ^ LIC/license number ^ LIS/license state ^ *LIY/license year* ^ LIT/license type**
or:
QV ^ LLC/lien license number ^ LIS/license state ^ *LIY/license year* ^ LIT/license type
or:
QV ^ VIN/vehicle identification number
or:
QV ^ VLN/lien vehicle identification number

Where: Note: - Inquiries may specify either **LIC/** or **LLC/** or, **VIN/** or **VLN/**

LIC/license number – is the vehicle license plate number.
Field length - Maximum 8 alphabetic/numeric characters. Example: YB1342N

LLC/lien license number – is the vehicle license plate number.
Field length - Maximum 8 alphabetic/numeric characters. Example: YB1342N

LIY/license year – is the license plate year of expiration.
Field length - Required 4 numeric characters. Example: 2003

LIS/license state[13] – is the NCIC State Code for the license plate issuing state.
Field length – Required 2 alphabetic characters. Example: NJ

LIT/license type[14] – is a NCIC Vehicle Data Code for the license plate type.
Field length – Required 2 alphabetic characters. Example: PC

VIN/vehicle identification number – is the vehicle manufacturer assigned number.
Field length – Maximum 20 alphabetic/numeric characters.
Example: 2G4WF5510Y9985912

VLN/lien vehicle identification number - is the vehicle manufacturer assigned identification number for which lien information is being requested.
Field length – Maximum 20 alphabetic/numeric characters. Example: (see VIN/)

[13] If ***LIS/license state*** is not provided, the CAD Message Switch will default this element to **VA**
[14] If ***LIT/license type*** is not provided, the CAD Message Switch will default this element to **PC**

Actions: **CAD Message Switch**

Formats various VCIN query message(s) based on the **required** elements provided….

If **LIC/** is provided and ***license state*** is **VA**[15], queries are generated for VCIN and Virginia DMV.

If **LIC/** is provided and ***license state*** is not **VA**, queries are generated for NCIC and, the indicated out-of-state registration information.

If **VIN/** is provided queries are generated for VCIN, NCIC, and Virginia DMV or the indicated out-of-state registration information.

If **LLC/** or **VLN/** are provided, a single query will be generated for Virginia DMV registration information.

Provides ***LIS/license state*** with a default of **VA** if the element isn't provided.
Provides ***LIY/License year*** with a default of the current year if the element isn't provided.
Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.

CAD

Creates a Unit History segment containing the query message. An Incident History segment is also written if the unit is currently assigned.

Responses: Alphanumeric text message of indefinite length.

5.5 QD (Query Driver) Command

Purpose: To spawn various queries of the Virginia DMV or out-of-state drivers license file for license status information, to request a Virginia driving record transcript or by mail, and conditionally, to query NCIC and VCIN wanted/missing and other files.

Command: **QD ^ OLN/license number ^ *LIS/license state ^ QTR/transcript request ^ COB/code or badge ^ COJ/jurisdiction***

or:

QD ^ NAM/name ^ DOB/birth date ^ SEX/gender ^ *LIS/license state ^ QTR/transcript request ^ COB/code or badge ^ COJ/jurisdiction*

[15] Either specified as or defaulted to.

Where: Note: - Inquiries may specify **OLN/** or, **NAM/, DOB/** and **SEX/**.

OLN/license number – is the subjects driver's license number.
Field length – Maximum 20 alphabetic/numeric characters.
Example: T19384756
LIS/license state – is the NCIC State Code for the OLN issuing state.
Field length – Required 2 alphabetic characters. Example: MA
QTR/transcript request - is an indicator that specifies a transcript of a subjects driving record is to be returned in a response message.
Field length – Required 1 alphabetic character must be either **Y**es or **N**o
COB/code or badge – is an indicator to signify that a transcript of a subjects driving record is to be mailed to the inquiring Unit.
Field length – Required 1 alphabetic character must be either **Y**es or **N**o
COJ/jurisdiction – is the County or City jurisdiction code for the Commonwealth Attorney that is to be mailed a copy of the subjects driving transcript.
Field length – Required 3 number characters. Example: 043
NAM/name – is the subjects name in the format: **last,first ^ middle initial**
Field length - Maximum 35 including alphabetic, comma, and space characters.
Example: Jones,John J
DOB/birth date – is the subjects date of birth in the format of: YYYYMMDD
Field length – Required 8 numeric characters. Example: 19430926
SEX/gender – is the single letter **M**ale, or **F**emale.
Field length – Required 1 alphabetic character.

Actions: **CAD Message Switch**
Formats various VCIN query message(s) based on the **required** element(s) provided….

If **OLN/** is provided and ***license state*** is **VA**[16], queries are generated for VCIN and Virginia DMV.

If **OLN/** is provided and ***license state*** is **not VA**, queries are generated for NCIC and, the indicated out-of-state.

If **NAM/, DOB/,** and **SEX/** are provided, queries are generated for VCIN, NCIC and, Virginia DMV or out-of-state as indicated by ***LIS/license state***

Provides ***LIS/license state*** with a default of **VA** if the element isn't provided.
Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.
CAD
Creates a Unit History segment containing the query message. An Incident History segment is also written if the unit is currently assigned.

Responses: Alphanumeric text message of indefinite length.

5.6 QH (Query Criminal History Index) Command

Purpose: To spawn queries of VCIN/NCIC criminal history indexes and Wanted/Missing Persons files, and the Virginia Sex Offender and Concealed Weapons Permit files, for the existence of subject records.

Command: **QH ^ NAM/name ^ DOB/date of birth ^ SEX/gender ^ RAC/race ^ PUR/purpose code**

[16] Either specified as, or defaulted to.

Where: **NAM/name** – is the subjects name in the format: **last,first ^ middle initial**
Field length - Maximum 35 including alphabetic, comma, and space characters.
Example: Jones,John J
DOB/birth date – is the subjects date of birth in the format of: YYYYMMDD
Field length – Required 8 numeric characters. Example: 19430926
SEX/gender – is the single letter **M**ale, or **F**emale.
Field length – Required 1 alphabetic character.
RAC/race – is the NCIC Personal Descriptor code for the subjects race.
Field length – Required 1 alphabetic character.
PUR/purpose code – is a VCIN/NCIC code that signifies the purpose for which the inquiry is being made.
Field length – Required 1 alphabetic character. Example: C

Actions: **CAD Message Switch**
Provides the Attention data element (**ATN/name**) with the name of the Unit requesting the Criminal History information.
Formats the query message and sends it to VCIN.
Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.
CAD
Creates a Unit History segment containing the query message.

Responses: Alphanumeric text message of indefinite length.
Criminal History Index query responses are limited to an indication that a history record either does, or does not, exist. Where history records do exist, responses will include verification of subject particulars and state and FBI record identification numbers only. Queries of Criminal History Information records are not supported by the Command Interface.

5.7 VCIN (Freeform) Command

Purpose: To afford mobile users the capability to enter VCIN/NCIC commands "by hand", without the assistance of a screen entry form. It is presumed that users of this freeform command style will be familiar with the VCIN/NCIC Message Key (MKE) codes, Message Field Codes (MFC), and all format requirements thereof.

Command: **VCIN ^ MKE .. MFC^1/field data^1 . MFC^2/field data^2 . MFC^n/field data^n**

Where: **MKE** – is a VCIN/NCIC defined code for the inquiry type. The MKE must be followed by followed by two period field delimiters. (ASCII x2E2E)
MFC – is a MKE specific field identifier code, followed by a / character (ASCII x2F).
field data – is the criteria associated with the MFC terminated with period (ASCII x2E).

Actions: **CAD Message Switch**
Forwards the message to VCIN. Sends a message copy to the appropriate Division CAD.
Forwards all VCIN response messages to the mobile user.
CAD
Creates a Unit History segment containing the freeform query. If the unit is currently assigned to an incident, an Incident History segment will also be written.

Responses: Alphanumeric text message of indefinite length.

Appendix A

Sample Responses Messages

A-1. Unit History

Command: UH 1442
Response:

```
Unit History For Unit: 1442 From: 03/19/01 21:00:01 To: 03/20/01 11:44:21
*** New Date: 03/19/01 ***
/2100  (******)  LOGON                #1219   MATTHEWS,MTP HUELL W JR
                                      DPST/010101A
/2254  (5856D )  1041                 #1219   MATTHEWS,MTP HUELL W JR
                                      DPST/010101A
*** New Date: 03/20/01 ***
/0000  (5869D )  MISC                 ,AREA OFFICE
/0000  (5856D )  MISC                 ,1037 AREA OFFICE
/0014            REMINQ               QL 1442 @WA3179.NC
/0025            DISPOS #DIV101052848 T/TS     [SB 95 AT 100MM ,042] .YNL3008
                                                ,BLU FORD
/0025            REMINQ #DIV101052848 QV 1442 YNL3008 VA PC
 0027            REMINQ #DIV101052848 QO 1442 T67110022.Y
/0031            CLEAR  #DIV101052848 D/UTS
 0040            DISPOS #DIV101052852 T/TS     [SB 95 AT 100MM ,042] ,NO MORE IN
                                      FORMATION
/0043            REMINQ #DIV101052852 QL 1442 @9MR824.KY
   44            REMINQ #DIV101052852 QVIN 1442 1FUYDXYB5LH383213.KY
   45            REMINQ #DIV101052852 QN 1442 PICKETT.RICHARD.L.19570128.M.KY
   46                   #DIV101052852 QVIN 1442 1FUYDXYB5LH383213.KY
   53  (5935D )  CLEAR             52 D/UTS
/0055            DISPOS #DIV101052853 T/TS     [SB 95 AT 99MM ,042] .LEEANNS.PA
                                                ,GRN PONTIAC
   55                                53 QV 1442 LEEANNS PA 2001 PC
   56            MISC                53 ,AT 99.5MM
  100  (5856D )  REMINQ               3 QN 1442 MCILHENNEY.LEE.ANN.19790608.F.PA
/0106            CLEAR  #DIV101052853 D/UTS
  116            DISPOS              60 T/TS     [SB 95 AT 100MM ,042] .KWC1OP.NJ
                                                ,MAROON TOYOTA
  116                               60 QV 1442 KWC1OP NJ 2001 PC
  119                               60 QL 1442@KWC10P.NJ
  120            REMINQ              60 QN 1442 JOHNSON.OTIS.P.19790318.M.NJ
  120            REMINQ              60 QO 1442 J61736127703792.NJ
/0122            MISC   #DIV101052860 ,1037 SB 95 AT 100
  128            CLEAR               60 D/UTS
  135            DISPOS              64 T/TS     [NB 95 AT 101MM ,042] .YNU1950
                                                ,SILVER FD EXPLORER
   35            REMINQ              64 QV 1442 YNU1950 VA PC
   41            REMINQ               4 QN 1442 LEE.MICHELLE.MARIE.19810428.F.MD
/0144            CLEAR  #DIV101052864 D/UTS
  201            DISPOS               7 T/TS     [SB 95 AT 100MM ,042] .KS9303
                                                ,NO MORE INFORMATION
  201                                 7 QV 1442 KS9303 VA PC
  202                                 7 QL 1442@YKS9302
  206            REMINQ               7 QN 1442 JABBIE.SAIDU.19671102.M.MD
  207            REMINQ               7 QOT 1442 D24200073564
  207            REMINQ               7 QO 1442 D24200073564.Y
/0209            REMINQ #DIV101052867 QO 1442 10012825.NC
  210                                 7 QN 1442 COOKS.AHMAL.JAHMAL.19760415.M.NC
  212            MISC                 7 ,SUSP
  218             ONTCT               7 Contact in  15 Minutes
   2             CLEAR                 D/UTS
/0223            REMINQ                QL 1442@WA3179.NC
   24                                  QN 1442 GRISSOM.GEORGE.WARREN.19461229.M.N
                                       C
   29  (5935D )  DISPOS             71 T/TS     [SB 95 AT 100MM ,042] ,T/T
```

```
  30                              71 QN 1442 GARAY.JOHN.ALBERT.19571009.M.FL
  35  (5856D )  CLEAR             71 D/UTS
 308            MISC                ,1037 AREA OFFICE
 346  (5935D )  DISPER            79 T/1046O  [NB 95 SO RT 54 EXIT 92 ,042]
 401  (5856D )  ROTREQ            79 TOW     ELLI  12    ELLIOTTS TOWING SERVIC
                                    E                          97982860
 402            REMINQ            79 QL 1442 @NWJ8397.NC
 402            MISC   #DIV101052879 ,FOUR SOULS ONBOARD
 403             OTENR #DIV101052879 ELLI
/0405           CLEAR  #DIV101052879 D/MOA WRK
 405            DISPER             4 T/105E             16.8MM ,016]
 41             MISC               4 ,1037 SB 101
 411            CHANGE             4 LOC: SB 95 AT 116.8MM ,016 -->  SB 95 AT 1
                                    01.5MM ,016
 411            ONSCNE             4
  11            CHGLOC             4 [DIV]
/0430           ONSCNE #DIV101052874
  33            CONTRL               G/G108
  34            CLEAR              4
 505            MISC                ,1037 AREA OFFICE
 509            DISPOS            85 T/TS     [SB 95 AT 100MM ,042] ,NO MORE IN
                                    FORMATION
 513            REMINQ            85 QN 1442 MOODY.DARREN.LEE.19671127.M.NC
 514             LEAR             85 D/UTS
/0520           DISPOS #DIV101052889 T/TS     [SB 95 AT 100MM ,042] ,NO MORE IN
                                    FORMATION
 52             REMINQ            89 QL 1442@YYF5027
 525            REMINQ            89 QO 1442 437589221.Y
 534             LEAR  #DIV101052889 D/UTS
 550            REMINQ               QN 1442 RODRIGUEZ.EULOGIO.19420922.NJ
  50            REMINQ               QN 1442 RODRIGUEZ.EULOGIO.19420922.M.NJ
  53            REMINQ               QN 1442 RODRIGUEZ.EULOGIO.JR.19420922.M.NJ
/0553           REMINQ               QN 1442 RODRIGUEZ.EULOGIO.19420922.M.NJ
  54                                 QO 1442 R60942450009422.NJ
 612            MISC                ,1037 101
 614                               98                                LITTLE RED
                                     HONDA
 614                               98        @BX798Y.NY
 618                               98 QN 1442 CRUZ.CLEMENTE.19710202.M.NY
 619            REMINQ             98 QO 1442 468188735.NY
 619            MISC   #DIV101052898 ,FALSE HIT
 625            CONTCT #DIV101052898 Contact in  10 Minutes
 628            CLEAR  #DIV101052898 D/UTS
 647  (5972D )                           THOMPSON.VIRGIL.ANTHONY.19670707.M
                                    .MD
  48            REMINQ               QO 1442 T5612843067539.MD
  51            REMINQ               QN 1442 BRAGG.DARIN.W.19740326.M.MD
/0653           REMINQ               QN 1442 BRAGG.DARIN.W.19740326.M.IN
  57                                         1950196171.IN
 700                                 QO 1442 1950196171.IN
 70             LOGOFF
```

A-2. Incident History

Command: IH #DIV101052338
Response:

```
Incident History for: #DIV101052338  Xref: #DIV101052340
 Case Numbers: $01211045

 Entered        03/19/2001  08:46:48  BY D103  CASH
 Dispatched     03/19/2001  08:50:36  BY D101  5582D
 Enroute        03/19/2001  08:50:36
 Onscene        03/19/2001  08:55:06
 Closed         03/19/2001  16:06:51

 Initial Type: 1050D      Final Type: 1050F  (VEHICLE CRASH FATALITY)
 Initial Priority: 2      Final Priority: E
 Disposition: ACR UTS UIN 102  Offense:          Source: 9    Primary Unit: 736

 Duty Post: 014401  SAC:
 Group: G144          Beat:       Map Page:
 Loc: RT 30 AT RT 652,016   (NV)
 Loc Info: RT 652 IS SIGNBOARD RD
 Name: 911
 Addr:                                      Phone:
/0846  (CASH  )  ENTRY         2 TT,NO PI'S,
/0847  (2565D )  HOLD

/0848  (4277D )  CHANGE        TYP: 1050D  --> 1050I
                               RSP: T   --> T
                               PRI: 2  --> E
/0848            SUPP          TXT: 1052 IS 1017
/0850  (5582D )  DISPER  593    #4878   BURTON,TII ANDREW J
/0850            ASSTER  610    #4613   COX,TPR JJ
/0852  (2565D ) $CROSS         #DIV101052340
/0852            DUP           #DIV101052340
/0852            DUP           NAM: HANOVER COUNTY
                               PHO: 8045376000
   53  (5582D )  MISC          ,163 HAS BEEN NOTIFIED AND I HAVE 042 UNITS GOING
                                UNTIL I CAN GET A 016 UNIT
/0855            ONSCNE  593
/0855            MISC    593   ,RT 30 IS BLOCKED DIRECTING TRAFFIC AROUND IT ON
                                HE SHOULDER
    6            CHANGE        LOC: SIGNBOARD RD/RT 30,016 -->  RT 30 AT RT 652,
                               016,
                               LOCI:  -->  RT 652 IS SIGNBOARD RD
    7  (2565D )  ONSCNE  610
  900            CHANGE        LOC: RT 30 AT RT 652,016 -->  RT 30 AT RT 652,016
                               ,
                               TYP: 1050I -->  1050F
/0900            MISC          ,163 HAS BEEN ADVISED
  902            MISC          ,392 HAS BEEN ADVISED
  90             ASSTER  599   [RT 30 AT RT 652,016]
                                #1784   MCLENNAN,MTP LELAND H JR
    0?           ASSTOS  927   [RT 30 AT RT 652,016]
                                #5129   DZIEDZIC,TII CHRISTOPHER A
/0909            ASSTER  736   [RT 30 AT RT 652,016]
                                #5263   COLLINS,TPR TERENCE P
    9            ASSTER  1577  [RT 30 AT RT 652,016]
                                #4003   MACFARLAND,TII JAMES L
/0910            PRIU    736
   12                               CONTACTING THE ME
```

```
   13            ASSTOS  392   [RT 30 AT RT 652,016]
                                #3649   STILES,SGT KERRY L
/0913            ASSTER  686   [RT 30 AT RT 652,016]
                                #5624   BUSH,TPR GEOFFREY T
/0913           $PREMPT  686
   15                    68
                                  624   BUSH,TPR GEOFFREY T
   15                    849
                                 5634   EDWARDS, TPR MASON G
    5            MISC    686   ,ON 1046 BY MISTAKE
   20           $PREMPT  610
   21            MISC           ,392 HAS BEEN ADVISED
/0922  (5582D )  MISC           ,538 NO ANSWER AND 1287 HAS AN APPOINTMENT TODAY,
                                 HE CANT MAKE IT
/0922            MISC           ,PAGED 1458 FOR RECON
   23  (2565D )  MISC           ,5092 HAS BEEN ADVISED
   24            CONTCT  392   Contact in  30 Minutes
/0924            CONTCT  593   Contact in  30 Minutes
   24            CONTCT  927   Contact in  30 Minutes
/0925            ONSCNE  736
   2             CLEAR   1577
    8            MISC           ,STORKE FUNERAL HOME WILL BE NOTIFIED
    8            ASSTER  1458  [RT 30 AT RT 652,016]
                                #3007   WEYANT,STP RICHARD A
/0928  (5582D )  MISC           ,1564 IS NOT AVAIL
    8  (2565D )  CLEAR   849
    9            ASSTER  5092  [RT 30 AT RT 652,016]
                                #5709   GELLER,PIO CORINNE N
    9            ONSCNE  686
   32                    736
   32  (5582D )  ASSTER  518    #3474   ELMORE,STP JAMES E
                                ,FOR RECON
   33                           335 WAS NOTIFIED FOR 518
   35  (2565D )  CONTCT  686   Contact in  30 Minutes
/0943            ROTREQ  392   TOWL    LHIL  441   HILLCREST GARAGE
                                                    918044483300
   44            ROTNAK  392   TOWV    LHIL   ,NOT AVAIL
   44           $ROTREQ  392   TOW     LN1   441   #1 TOWING COMPANY INC
                                                    918044489898
   45            ROTENR  392   LN1  ,LN1 1017
   47            ROTREQ  392   TOWL    LBUD  441   BUDS TOWING
                                                    918044484500
/0949            ROTENR  392   LBUD ,LBUD 1017
   49            ONSCNE  5092
   52            ONSCNE  599
   56            ONSCNE  1458
/1006            REMINQ  927   QV 927 1HSRDG2R4JH547962
 1007             EMINQ  927   QV 927 79562
 1007            CONTCT  593   Contact in  30 Minutes
/1007            CONTCT  599   Contact in  30 Minutes
 1007            CONTCT  686   Contact in  30 Minutes
 100             CONTCT  736   Contact in  30 Minutes
/1007            CONTCT  1458  Contact in  30 Minutes
 1007            CONTCT  5092  Contact in  30 Minutes
 1022            CONTCT  392   Contact in  30 Minutes
 1030            CLEAR   392
 1031            MISC           ,STORKE 1023 AND VDOT AND 1051'S HAVE ROAD BLOCKE
                                D
   38            CONTCT  593   Contact in  30 Minutes
   38                      9
   38                    686
```

```
   38                  73
   38                  927
   38
   39
   46             LEAR   927
   48                    593
   58            REMINQ  736   QO 736 231849764
/1109            MISC          ,1731 FROM AREA 2 WILL TRY TO LOCATE NEXT OF KIN
  109                      9
  109                   686
  110                   1458
  110                   5092
  110             LEAR   5092
  136                   736
  144             LEAR   686
  145             HGLOC  736   [AREA]
  201            ASNCAS        $01211045
  241            CHGLOC 599   [BUDS]
  241            CONTCT 1458  Contact in  20 Minutes
  306            ONSCNE
  315            ONSCNE 736
  319            MISC          ,REF KENNETH KING,INFO FROM 1733,PHS ADDRESS IS 2
                               302 COAN STAGE RD,HEATHSVILLE VA AND THEIR PHONE
                               NUMBER IS 580-4736 AND NO ONE IS THERE
  344
  348            MISC          ,U 1733 HAS MADE NOTIFICATION WITH SUBJECTS' WIFE
  35              LEAR   599
  358            CONTCT 1458  Contact in  20 Minutes
  402  (5582D )  GDISPO 736   DSP: ACR.UTS.UIN.WRK
                               ,X2
  433  (2565D )  CONTCT 736   Contact in  30 Minutes
  444  (5535D )  OK     1458
  504            OK     736
/1507            CLEAR  1458
/1507            CLEAR  518
  606             LEAR         DSP: ACR UTS UIN  --> ACR WRK 102
  606            CLOSE  736
```

A-3. Unit Roster

Command: UR G101

Response:

Unit Roster for D101 Requested on 03/20/01 11:45:49

Unit	Type	Group	Date	Time	Id	Name	Dpst
214	S	G101	03/20/01	05:00	#1969	AUSTIN,FSG GEORGE W JR	010101
346	S		03/20/01	05:00	#3790	MILLNER,SGT M WADE	010101
392	S		03/20/01	05:00	#3649	STILES,SGT KERRY L	010101
593	T		03/20/01	05:00	#4878	BURTON,TII ANDREW J	010101I
610	T		03/20/01	05:00	#4613	COX,TPR JJ	010101J
783	T		03/20/01	05:00	#4625	JONES,TII TONY B	010101A
>849	T		03/20/01	05:00	#5634	EDWARDS, TPR MASON G	010101A
927	T		03/20/01	05:00	#5129	DZIEDZIC,TII CHRISTOPHER A	010101C
+>1287	T		03/20/01	08:42	#2027	REED,MTP DONALD R	010101A
>1417	T		03/20/01	05:00	#5349	MAYER,TPR ERIC D	010101C
+>1538	T		03/20/01	06:58	#5055	WELLS,TII MITCHELL M	
>1543	T		03/20/01	05:00	#5672	WILLIAMS,TPR BEN D	010101C
>1617	T		03/20/01	05:00	#3884	HARRISON,STP THOMAS S	010101C
1670	T				4315	LEWIS,TII DAVID A	A
>1679	T		03/20/01	06:53	#5175	NEILSON,TII ELLEN M	
1717				10:16	#5781	PATTERSON,TPR MATTHEW T	

A-4. Unit Status

Command: US G101
Response:

Unit Status for G101 Requested on 03/20/01 11:46:23

Unit	Status	Group	Time	Incident	Type	Location
214	AVL	G101	07:15			
346	AVL		07:25			ON-CALL
392	AVL		06:59			
593	AVL		10:43			
610	AVL		08:23			
+783	ENR		11:46	#DIV101053130	1093	NB 95 NO DOSWELL
>849	OUT ONS		08:36		CTG	043
927	SPC		08:03			CO043
+>1287	OUT ONS		08:42	#DIV101053010	WZ	W BROAD ST/GASKI
>1417	OUT ONS		08:38		CTG	043
+>1538	OUT ONS		06:58	#DIV101052915	WZ	VDOT SHORTPUMP,0
>1543	OUT ONS		08:35		CTG	043
>1617	OUT ONS		08:27		CTG	043
1670			11:23			
>1679	OUT ONS		09:43		SA	
1717			11:35			

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CJIS SYSTEM SECURITY

II. System Security

A. System Security is defined as the overall security measures, which must be observed by all participating VCIN terminals.

1. The VCIN system shall only be used by authorized criminal justice agencies to transmit and receive criminal justice information for criminal justice purposes.

2. Any external computer system interfacing with VCIN must either be dedicated to and operated by a Criminal Justice agency, or management control over that portion of the system must be under a Criminal Justice agency.

3. Only the terminals and printers on your interface system that are approved by the VCIN administrative office will be permitted access to the VCIN system. All printers will be located within the same room as the approved terminal to which the printer is connected. The data received from the VCIN system **shall not** be retransmitted to another terminal, printer, or any other computer system not approved by the VCIN administrative office.

4. Any VCIN user agency, which acts as a control point for any other agency must assume responsibility for and enforce all security measures necessary to prevent degradation of the VCIN network.

5. Information obtained through the VCIN system must be destroyed (shredded, burned, or electronically obliterated) after it has served the purpose for which it was obtained.

. 6. All terminals connected to the VCIN system without going through a remote interface, (i.e. GLINK or CyberLINXX connection), will be assigned their own IP address, four character terminal address and ORI.

7. Electronic data received through the VCIN system **shall not** be stored within your computer system for later retrieval, except for information required to be maintained regarding mobile terminals. Any future need of the data shall require that it be retrieved from the VCIN system.

a. Any traffic sent and received through a mobile terminal shall be logged within your system to identify which operator made the request for and received the data. If the data is reviewed by another operator, i.e. to assist the requestor, the access must be logged. The log shall be maintained for a minimum of two years.

b. All information obtained from VCIN that resides on an MCT, must be deleted after if has served the purpose for which it was obtained.

8. Requests for Mobile Data Terminal (MDT) systems and Mobile Computer Terminal (MCT) computers shall be made in writing from the Agency Head to the Criminal Justice Information Services Division Commander, and a meeting shall be held between requesting agency personnel, to include their data processing personnel, VCIN administrative staff, and State Police data processing personnel. All MDT systems shall be connected through an interface with Originating Agency Identifiers (ORI), a four character terminal address and IP address or other designation assigned or approved by the Virginia State Police.

   a. All traffic will be transmitted through the VCIN system with the mobile terminal address and ORI number assigned by the VCIN administrative office.

      1) Only MCTs connecting through the MDT system shall be permitted to use the ORI and four character terminal address assigned to that MDT system. All other terminals will be assigned their own four character terminal address and ORI.

      2) If more than one agency is using MCTs on the same MDT system, an additional agency specific ORI will be assigned to the MDT system. All ORIs assigned will be associated with the MDT system's single IP address.

         a) The MDT system will be responsible for appending the appropriate agency ORI to VCIN messages for the respective MCT.

   b. Mobile terminals shall be authorized to communicate from car to car, car to base, and inquire into the databases of the NCIC/VCIN and NLETS systems, except for criminal histories.

   c. Criminal history information shall not be transmitted to a mobile terminal.

   d. The MCT may have access to the VCIN system only when installed in a police vehicle or when operated in a police facility. If the terminal is removed from the police vehicle or not operated in a police facility, the VCIN connection shall not be used except for emergency purposes or functional testing by authorized personnel. Functional testing shall be limited to approved test records or permission of the subject identified in the record.

   e. MCTs must be secured at all times to prevent unauthorized persons from accessing NCIC/VCIN or viewing any information obtained through the VCIN system. Mobile terminals must have at least 128-bit encryption for all data transmitted and received per NCIC Security policy.

   f. If an MCT is either lost or stolen, the using agency shall be responsible for insuring that access to the VCIN system by that MCT is disabled. Written notification of the loss and preemptive actions taken shall be immediately provided to the Criminal Justice Information Services Division Commander at the Virginia State Police.

9. All Virginia laws, policies, federal laws, FBI/NCIC policies, DMV, and NLETS policies shall apply in all cases concerning file security, control, and system security for any transaction involving the computer databases.

10. PCs and Mobile Computer Terminals that have access to VCIN, except for those PCs that utilize CyberLINXX software for VCIN access, shall not be accessible from the Internet.

11. Passwords for system access

    a. When a VCIN terminal operator has been assigned a sign-on and password to access the VCIN system, the authorizations shall be used only by the person to whom they are assigned. If the operator provides the sign-on and password to another person or causes the sign-on or password to be displayed for use by another person, their VCIN access and certification shall be suspended for a period not to exceed 30 days by the VCIN administrative office. Any subsequent violations of the password requirements shall result in a 6-month suspension of their VCIN access and certification.

    b. When the VCIN administrative office assigns a sign-on and password for the CyberLINXX system, a letter will be sent to the Agency Head with this information. The Agency Head or his/her designee will disseminate this information only to the operator to whom it is assigned. If an operator forgets their password, they must obtain it again from the Agency Head or his/her designee. The VCIN Control Center will not have a list of the operators' sign-on and passwords.

APPENDIX Q

THIRD PARTY USE OF THE

STARS SITES

1.0 Introduction

This document is intended to establish safeguards and policies to assure that the Commonwealth of Virginia (COV) has primary beneficial use of COV sites while allowing System Integrator (SI)/Third Party use. Third Party use is allowed by other COV governmental entities and organizations to provide a financial benefit to the COV for allowing this additional use.

Each Third Party User requires a separate SI/Third Party User agreement which assures that this intended use shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, and 10.

This document describes five categories:

- Physical Infrastructure
- Management of Sites
- Security of Sites
- Operational Requirements
- Financial Requirements

2.0 Physical Infrastructure

2.1. General

Physical facilities required for the system includes site preparation, radio towers, radio buildings, back-up power systems, electric power systems and lighting, and all other work associated with the named features, as required for complete and finished facilities. All physical facilities provided by the SI for a Third Party User in the completion of this SI/Third Party User agreement shall meet the requirements as established by the COV in the Contract awarded as a result of RFP #2001-035, including Section 10.

The physical infrastructure used to support the LMR, MCT, MW, and intranet systems shall be installed and maintained in accordance with the requirements established by this contract, in this regard regardless of any third party usage, there shall be reporting and record keeping procedures as stated in this document, that insure such standards. Regardless of any third party usage, all maintenance records both preventative and repair shall be available and provided on a quarterly basis for the COV Project Manager's inspection and approval.

The SI shall not allow any Third Party use to cause any diminishing of the contracted services or system capabilities. Any such event shall be immediately declared to the COV Project Manager. Corrections shall be immediately performed at no cost to the Commonwealth.

The Third Party applicants shall be required to submit an engineering plan 90 days prior to any use that will be subject to approval by the COV Project Manager. Expected plans shall address the following engineering documentation:

- The required number of preliminary design plans containing at a minimum the site layout, property boundaries, location of additional tower or shelter (if applicable), distance from the base of the tower to adjacent properties and rights-of-way, equipment buildings, and security measures provided.
- Description of the Third Party's use of the site, contact information, and maintenance service provider and their contact information.
- Structural Analysis of the existing tower to include proposed antennas to be placed on the tower. Any single element of the tower shall not be stressed beyond 85% capacity or if tower does not exceed sway or twist limitations established by TIA/EIA-222.
- Antenna design showing types, centerlines, frequency bands, and azimuths.
- Shelter reserve capacity (lines available in bulkhead, HVAC, room space, backup power, main power) if a COV shelter is used.
- Frequency resources provided if LMR or mobile data user.
- MW capacity (if used).
- Intermodulation analysis.
- Site power capacity (both commercial and backup) and additional fuel for emergency generators

- Electrical and Grounding Plan for planned equipment to include, antennas, equipment buildings or platforms, emergency generators, and primary power utilities, which shall meet the requirements as established by the COV in the Contract awarded as a result of RFP #2001-035, including Section 10.

2.2 Interference

The COV shall be protected from impeded system access due to interference (including jamming or hacking) either from external or internal sources. In instances of interference, the SI shall be responsible to research, locate, evaluate the problem, and correct at no cost to the Commonwealth. Prior to implementing any corrective action, the SI shall present the corrective plan of action to the COV Project Manager for approval.

The SI shall substantiate and document that the planned installation has no adverse effect on existing COV equipment or communications. This may require the SI to retest the site coverage when a new antenna is placed into operations at a location near a COV antenna. Documentation shall demonstrate the following:

- Guarantee that the antennas or equipment installed will not structurally block or electrically interfere with the COV communications systems. This documentation shall include an analysis of potential interference against the operating COV frequencies.

- Documentation that Electro-Magnetic Radiation Exposure (EME) levels are in accordance with 47 CFR and COV RF Radiation Exposure Plan (Appendix K). The operating parameters of the planned installation shall address the impact of total site EME levels.

2.3 Aging

In instances of deterioration of towers, structures, or other physical facilities due to aging or normal use, the SI shall research and evaluate a solution. A plan of action would then be determined with the COV Project Manager's agreement.

2.4 Regulatory

The sites shall at all times be operated in accordance with all FCC, FAA and other applicable rules and regulations. There shall be proper documentation confirming this available to the COV and any other regulatory agencies. The consequence of a failure in this area may be the immediate removal of the Third Party User from the site. The Third Party User shall suffer immediate termination of services.

Once the installation has been accepted for operation the Third-Party User shall provide the following radio documentation:

- FCC/ FAA license information (if applicable) for the new equipment.
- Final installation engineering documentation showing the revised site layout, building and tower locations, fencing, site access, and electrical and mechanical equipment documentation.

All physical infrastructure work done by the SI and/or Third Party User (under direct SI supervision and responsibility) under the SI/Third Party Agreement shall be in accordance with applicable codes, statutes and ordinances imposed by governmental bodies having jurisdiction. These legal requirements may be augmented by industry standards, an agreement, and the Third Party User's internally developed design / installation procedures. Where references conflict, the most stringent requirements shall be followed.

In the absence of other direction, as a minimum, all facilities shall be designed and installed in accordance with the most recent revision of the BOCA National Building Code and the National Electric Code (NFPA 70).

The SI shall insure that any Third Party performs installations and maintenance only if they provide a separate shelter. Only the SI shall be authorized to climb a tower and perform installations.

2.5 Maintenance

The Third Party equipment shall be designed in such a manner as to allow proper maintenance. This includes the layout of equipment, labeling, as-built documentation, and record keeping.

The SI shall comply at all times with all of the Contract requirements including, but not limited to:

- Tower Capacity (COV Space)
- Building Capacity (COV Space)
- Power supply (both primary and back-up)

The SI shall insure that the Third Party Users shall maintain at all times sufficient staff with appropriate levels of expertise and training to perform the maintenance of their system. The SI shall take into account the geographical distribution of the Third Party fixed equipment sites and have resources throughout the required area to respond to and perform required maintenance. The SI shall require of any Third-Party user a maintenance plan that addresses the following items:

- Notification to the COV that the system is being placed into operation.
- Agreement with COV that the Third-Party User shall participate in a responsible maintenance program to make certain that their equipment is operating safely and efficiently.
- Agreement to notify the COV when the Third-Party User is planning an installation upgrade to their existing system.

2.6 Redundancy

COV redundant and back-up systems shall be maintained and tested by the SI to the same levels, as are the primary systems. systems. COV redundancy shall not be interfered with or compromised by any Third Party use. The SI shall not allow any Third Party User to operate on the COV emergency power systems unless granted written permission by the COV Project Manager.

3.0 Management of Sites

3.1 General

The COV Project Manager will establish and approve all policies applicable to operations and will be authorized to act on behalf of the COV on all matters in connection with the SI/Third Party Agreement. The SI shall, at all times, employ qualified and sufficient personnel for completing work in the manner and time required. The key SI personnel listed in the Contract awarded as a result of RFP #2001-035, shall be the personnel assigned to perform the SI/Third Party Agreement and not substituted or removed from their positions prior to obtaining the consent of the COV Project Manager, whose consent will not be unreasonably withheld.

The SI shall approve, and provide supporting documentation to the COV Project Manager, of any subcontractor utilized by a Third Party in construction, maintenance, or upgrade of the Communications System. Such documentation shall include the subcontractor's capabilities, resources, and the resumes of personnel supervising being performed work at the site.

The SI shall provide the COV Project Manager access to all information concerning the operation and condition of the sites. This information shall include all reports generated by the site monitoring computers, as well as manually completed maintenance, installation, repair, and routine reports completed concerning the LMR and microwave radio system sites. The COV Project Manager shall have access to equipment that allows for the ability of the COV to monitor site performance parameters.

The SI shall not have any discussions with COV jurisdictions or COV agencies not currently operating on the network, unless the COV Project Manager (or designee) is in attendance.

3.2 COV Access

Regardless of any Third Party usage, the SI shall provide the COV Project Manager (or designee) free and open access to all sites in use in the system. Regardless of any Third Party usage, the SI shall provide the COV Project Manager (or designee), at all reasonable hours, open inspection of all supporting equipment.

3.3 Site Condition

The SI shall ensure that the Third Party User complies with all policies and procedures governing access to and use of COV facilities. All Third Party Use contracts will be with the SI, and they alone are allowed access to shelters. The SI shall escort and be responsible for all personnel at the site. At all times during which the Third Party User uses space in the COV facilities, the SI shall ensure that the Third Party User shall use all reasonable care to comply with applicable agreements of the COV relating to such space; and use all reasonable care to maintain the space in the condition in which it existed immediately prior to the date on which the Third Party user was given access to the space.

The SI shall ensure that the Third Party User is responsible for providing, promoting, and requiring worker compliance with safe, clean, and sanitary construction work sites that meet or exceed all OSHA or other regulatory requirements. The SI shall be responsible for the qualifications and oversight of all Third Party User-controlled personnel including subcontractors.

3.4 Regulatory

Any agreement between the SI and a Third Party User is subject to all terms and conditions associated with all of the COV outstanding FCC/FAA licenses, applications and authorizations from the FCC/ FAA and other federal, state and local government agencies with respect to the STARS System.

The SI and Third Party User shall prepare all regulatory licenses, consents, approvals and waivers reasonably necessary for the ownership and operation of any portion of the STARS System used.

The SI and Third Party User shall pay all charges, fees and taxes in regard to obtaining such licenses, consents, approvals and waivers. The SI and Third Party User shall cooperate with the COV in obtaining the use of needed state-owned sites (which are to be primarily used) including, but not limited to, all zoning and land use permits relating to the Communications System. The COV will retain ultimate control and authority over its FCC licenses and their use, which will at no time be transferred to the SI or Third Party User.

Third Party use of a site shall not cause combined emissions with the COV to exceed 47 CFR limits. If it is necessary to meet OSHA requirements, Third Party use shall be immediately (temporarily) suspended (or powered down to a safe level) if a public safety situation requires repairs or modifications on a tower. Third Party users shall provide access within two weeks of notification to the tower by powering down to a safe level or suspending transmissions if it is necessary for tower technicians to meet OSHA requirements.

3.5 Enforcement

Regardless of any SI/Third Party agreement, the COV retains the right to require the removal from COV premises, or from a position of responsibility pertaining to the upgrade, maintenance, or operation of the system, any employee, any subcontractor or other person the COV deems inappropriate for any reason. There shall be zero tolerance to sexual harassment, discrimination, and inappropriate communications.

If at any time the SI or Third Party User is found to be in violation of the terms of this agreement, the COV has the right to take recourse against the SI as established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 3, 4, and 5.

4.0 Security of Site

In addition to the items addressed in this agreement, the SI and Third Party User shall meet all security requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, and 10.

4.1 General

The SI and any Third Party User shall be expected to comply at all times with all COV security policies concerning the use of the sites and any system equipment. For any failure to maintain this security, the SI or Third Party user shall either restore all affected equipment at no charge and/or reimburse the COV for all labor and other expenses for this restoration.

The SI shall be responsible for changing or rekeying locks (or reprogramming if electronic locks) whenever a key is lost, there is a change in personnel, removal of a Third Party User or any other time as requested by the COV Project Manager.

4.2 Clearance

The SI and Third Party User shall have each of its employees, subcontractors, consultants and principals/owners, at the option of the COV, subject to a background check at anytime and shall meet all security requirements at all times.

All SI and Third Party employees, that would access a COV site, shall successfully undergo a VSP background check. No SI or Third Party User employee shall be allowed to enter a COV site without previous authorization by the COV Project Manager. It shall be the SI responsibility to request a VSP background check when its employees and the employees of the Third Party User are replaced. A cleared SI or Third Party User employee shall escort all subcontractors that access a COV site. The SI shall be completely responsible for all subcontractors. The SI shall notify the COV Project Manager, within three working days, when any person is removed from the approved access list.

4.3 Confidentiality

Should the COV Project Manager notify the SI of any activities, changes, plans or events that may significantly affect the operations of the system, the SI and Third Party User shall treat all information received as confidential. The provisions of the COV would govern disclosure of any confidential information.

4.4 Nature of Use

All agreements with the SI and Third Party Users shall allow the COV to exercise judgment into the appropriateness of the intended use of the site. All agreements shall allow for the preclusion or removal of groups participating in criminal activity, or groups, which advocate violence or discriminatory activity.

5.0 Operational Requirements

5.1 General

The COV Project Manager will establish and approve all policies applicable to operations and would be authorized to act on behalf of the COV on all matters in connection with third party agreements.

5.2 Site Usage

The amount of equipment available for Third Party usage at each site shall be restricted to that which would not impede COV usage.

The COV will reduce any Third Party usage in the event that such impedance or restrictions of COV use occurs.

The COV will have the ability to reconfigure site usage parameters under emergency conditions.

5.3 Expansion

The SI shall keep the COV fully informed as to how much extra capacity is available for each site and communications system on a quarterly basis. The sites shall be designed such that capacity can be expanded in the following ways:

- The amount of equipment at the site
- The types of equipment at the site
- New agencies or third party users that may use the site
- Added geographic areas shall adhere to the same standards

5.4 New Technologies

New technologies added to the site shall not degrade the site performance. The system shall continue to operate as a whole and integrated system.

5.5 Priority

Availability of the site and common equipment shall be configured so that availability of the site for lease can be organized into priority levels. In areas of high value of sites, higher priority users would be given preference over users with lower priority in assigning leases. The priority assignments are:

- COV Public Safety
- Local Governments within the COV
- Federal Public Safety
- COV Public Service
- Non-COV Public Service
- Commercial

5.6 Changes or Termination

The SI may change or terminate a Third Party User agreement or any part of it without notice or liability if a change has occurred in the SI agreement with the COV. The COV Project Manager shall approve such change or termination.

If at any time the SI or Third Party User is found to be in violation of the terms of this agreement, the COV has the right to take recourse against the SI as established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 3, 4, and 5.

6.0 Financial Requirements

6.1 Area of Operation

The COV will not fund the increase in coverage, in geographic areas of coverage not required by COV operations, to accommodate Third Party usage. Any expansion of any established geographic area of coverage beyond COV required coverage shall be completely funded by the SI and/or Third Party. The conditions of use in this geographic area of coverage shall be the same as the remainder of the system.

6.2 Equipment

The amount of equipment any Third Party User may have at the site shall be determined as described in this document. This amount along with the impact of the equipment installed at the site shall be the basis for calculation of a monthly usage fee. These equipment factors include:

- Development of an additional tower at the site.
- Tower loading on the COV tower.
- Addition of the Third-Party User's equipment building or shared floor space within the COV equipment facility.
- Circuit utilization on the COV communications network. This includes two-way radio, mobile data, and microwave infrastructure.

6.3 Site Usage

The amount of equipment available for Third Party usage at each site shall be restricted to that which does not impede COV usage.

Third Party usage shall not affect COV communications. No Third Party equipment shall impede the COV's ability to reconfigure site usage parameters under emergency conditions.

6.3 Reporting

The SI shall provide documentation in a consistent format, established at the time of the agreement, which is acceptable to the COV. Initially and unless agreed to by the COV Project Manager, all documentation shall be generated in MS Office and AutoDesk AutoCAD. The SI shall provide the COV Project Manager original documentation in MS Office, AutoDesk AutoCAD, and Adobe Acrobat as well as a hard copy. All manufacturers' documentation, not available in AutoDesk AutoCAD or MS Office, must be submitted in Adobe Acrobat PDF format. As-built documentation shall include modifications and the final configuration. Updates to documentation shall be provided quarterly as required.

The SI and Third Party User shall maintain books; records and other compilations of data pertaining to the requirements of the SI/Third Party Agreement to the extent and in such detail as needed to substantiate compliance for the SI/Third Party Agreement.

The SI shall provide COV access to both raw and compiled data. All such records shall be kept for a period of five (5) years or for such longer period as is specified herein and be made available to COV in soft format. If any litigation, claim, negotiation, audit or other action involving the records is commenced prior to the expiration of the applicable retention period, all records must be retained until completion of the action and resolution of all issues resulting there from, or until the end of the applicable retention period, whichever is later.

Prudent business practices shall be utilized and the sites shall be marketed consistent with usual and customary practices and rates. On a quarterly basis, the SI shall provide to the COV a summary of all current leases by third-party subscribers. The summary shall be in electronic format and include the lessee's name, lease expiration date, and lease amount. The COV will maintain copies of individual leases. The SI shall include the COV Project Manager in the negotiation for all issues that involve COV sites or the STARS.

The SI shall provide the COV access to all information concerning the financial operations of the site. This shall involve all reports generated concerning the site, as well as manually completed maintenance, installation, repair, and routine reports completed concerning the site.

Duly authorized representatives or designees of the COV shall have the right at reasonable times and upon reasonable notice to examine and copy, at reasonable expense, the books, records and other compilations of data of the SI and Third Party User which pertain to the provisions and requirements of the SI/Third Party Agreement. Also the COV shall have access that includes on-site audits, review, copying of records, and copies of backups for all documentation. All documents, papers, letters or other material relating to the SI/Third Party Agreement that are provided to the COV in conjunction with the SI/Third Party Agreement will be public records and available to public access and for audit purposes, for a period of five (5) years after completion of the agreement. These same materials and documentation will be subject to the Virginia Freedom of Information Act, Article 1**, Freedom of Information Act § 2.1-342.01** (as amended). Items that would be exempt from this would be those so described in the Code of Virginia.

6.4 Dispute Resolution

Rapid response is important in the resolution of SI/Third Party disputes. Should any disputes arise with respect to the SI/Third Party Agreement, the SI shall act immediately to resolve any such disputes. The SI shall notify the COV Project Manager, within 24 hours, of any such dispute. The SI shall also provide weekly updates, to the COV Project Manager, of its progress toward resolution of any such disputes.

The SI shall agree that, the existence of any SI/Third Party dispute notwithstanding, they will continue without delay to carry out all their responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV. Should the SI fail to continue to perform its responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV, any additional costs incurred as a result of such failure to perform shall be borne by the SI.

THIRD PARTY USE OF THE

STARS LMR AND MW NETWORKS

1.0 Introduction

This document is intended to establish safeguards and guidelines to assure that the Commonwealth of Virginia (COV) has primary beneficial use of the Statewide Agencies Radio System (STARS), Land Mobile Radio (LMR) and Microwave (MW) Networks while allowing System Integrator (SI)/Third Party Use. Third Party Use is allowed by other COV governmental entities and organizations to provide a financial benefit to the COV for allowing this additional use. The use of these networks by Federal or Public Service organizations may be allowed with the concurrence of the Commonwealth and the Federal Communications Commission.

Each Third Party User requires a separate SI/Third Party User agreement which assures that this intended use shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 5, 6, and 7.

Physical non-LMR and non-MW site equipment, any impact or use of is described in STARS Guideline for Third Party Site Usage document.

2.0 Process

A. User Priority

The SI shall allow Third Party access to and use of the LMR/MW according to the following priority list:

1. COV Public Safety
2. Local Government within the COV
3. Federal Public Safety
3. COV Public Service
4. Non-COV Public Service
5. Commercial (Microwave Only)

The SI shall enforce the priority listing and manage any Third Party Use to assure that the primary mission of the LMR and MW Networks are fulfilled (which is to facilitate COV communications). The SI shall demonstrate, by reports submitted quarterly to the COV Project Manager, that these requirements remain in force.

B. Application - LMR

Organizations interested in becoming users of this system shall submit a proposal to the SI. This proposal shall be reviewed and jointly agreed to by the SI and the COV. Included in this proposal shall be the following:

1. Description of the Third Party User
2. Description of the use by the Third Party User (How the LMR Network will support their mission.)
3. Total number of users to be added
4. Existing radio frequencies, licensed by the third party, to be dedicated to this access.
5. A copy for each of FCC licenses for these existing frequencies.
6. Number of subscriber units to be added (including any used in a fixed location.)
7. Anticipated usage patterns in the form of a complete LMR traffic analysis.
8. Hardware and software to be used for access. This should include make(s) and model(s) of subscriber radios, make(s) and model(s) of fixed radio base station equipment. Also, included should be make(s) and model(s) of MW terminating and interfacing equipment.
9. Security measures to meet the requirements of this document.
10. Agreement of the Third Party Users to the connection requirements of this document.

C. Application - Microwave

Organizations interested in becoming users of this system shall submit a proposal to the SI. This proposal shall be reviewed and jointly agreed to by the SI and the COV Project Manager. Included in this proposal shall be the following:

1. Description of the Third Party User
2. Description of the use by the Third Party User (How the MW Network will support their mission.)
3. Existing MW frequencies, licensed by the third party, to be dedicated to this access.
4. A copy for each of FCC licenses for these existing MW frequencies.
5. Hardware and software to be used for MW access. This should include make(s) and model(s) of MW terminating and interfacing equipment.
6. Security measures to meet the requirements of this document.
7. Agreement of the Third Party Users to the connection requirements of this document.

D. Radio Frequency Authorizations

Any waiver or request for special consideration by the Federal Communications Commission (FCC) shall be provided by the SI to the COV PM.

The COV PM will submit any such documentation to the Commission. Potential Federal Third Party Users shall obtain the concurrence of the COV PM of any documentation prior to it being submitted to the National Telecommunications and Information Administration (NTIA).

3.0 Connection

Third Party Users of the LMR and MW systems are expected to provide licensed radio frequencies that are compatible with STARS for this access. Existing COV frequencies shall not be used for Third Party access to the LMR except as specifically authorized in writing by the COV Project Manager. Third Party Users of the MW system are expected to use spare capacity designated as available to Third Party use. Third Party Users shall not consume spare capacity designated to COV use. All costs including transmit and receive hardware, software and any other connection costs should be born by the SI or the Third Party. Any erection of antennas, masts, transmit or receive equipment or any other site modifications shall meet the requirements for that use. These requirements are contained in the requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 6 and 7. The COV shall not be expected to participate in the costs of connecting other frequencies to the LMR or MW.

Connections shall be designed and implemented in the MW network such that Third Party connections are completely separate from COV connections. Capacity of MW radio links and MW terminating equipment may be shared but interconnections at the end points shall be separate. Third party interconnection points shall be serviceable without any disruption to COV interconnections or operations.

Third Party User LMR fixed equipment shall be designed and implemented completely separate from COV LMR equipment. Service operations to any LMR equipment shall not affect COV LMR equipment or operations.

Third Party User LMR operation shall not change, degrade, or interfere with any COV LMR operations. This shall apply to voice and data services and include channel busy conditions, call blocking, call queuing, noise performance, and RF coverage performance.

COV reserves the right to upgrade the LMR or MW networks. These upgrades may require Third Parties to modify existing equipment and software or to purchase new equipment or software. The COV shall not be responsible for any Third Party costs to meet any COV upgrades. All SI/Third Party agreements shall contain a warning to Third Party Users that system technology upgrades may be performed without notification and that the Third Party User is responsible for any cost changes resulting from COV LMR or MW upgrades.

Connections shall be established and maintained by the SI. The SI shall be responsible to assure that the connection is not used in excess of what has been agreed to between the SI and the COV Project Manager.

Where excessive usage is not reduced or eliminated, the SI (with concurrence from the COV Project Manager) or the COV Project Manager may suspend access for the individual user and or the agency or take other action to mitigate the problem.

Situations may arise where user(s) may be restricted from accessing the system. Whether this situation arises from physical limitations of radio coverage, or other causes, the COV shall not be held responsible.

The final authorization for allowing the connection will remain with the COV Project Manager. The COV Project Manager retains the authority to deny access to any data source(s), which may cause a problem to the system and/or other users of the system.

The SI shall monitor use of the system and bill the Third Party user according to the service provided. The SI shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, and 13.

4.0 Software and Hardware

The SI shall be responsible to assure that all Third Party hardware meets the requirements of the system and is acceptable for this application.

Any software used by the Third Party User shall not conflict with SI proprietary and confidential information as protected by applicable intellectual property and other laws. Third Party Users shall neither modify, nor distribute works based on the SI supplied software.

If the SI, at its discretion, provides assistance in installing or using of software or data by any Third Party User of this system, the COV shall not be held liable for any claims resulting from such agreements.

5.0 Security

Third Party User(s) shall be responsible for all activities that occur under any authorized password or account. The SI shall establish and enforce all password access of Third Party User(s). Password(s) shall be handled as confidential. The Third Party User shall immediately (within 24 hours) notify the SI of any unauthorized use of a password or account or any other breach of security. The SI shall take immediate (within 24 hours) action to suspend the suspect account until adequate security can be re-established. The SI shall also immediately (within 24 hours) notify the COV Project Manager of any such breach in security.

The SI shall not screen, monitor, or record any Third Party User(s) LMR content. The COV will not screen, monitor, or record any Third Party User(s) LMR content. The COV will not be held responsible for any harmful, inaccurate, unlawful, or otherwise objectionable content originating with or otherwise obtained through this system.

In addition, the SI shall meet all security requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, 6, and 7.

6.0 Other Considerations

Any Third Party User agreeing to use the LMR system, shall agree to the following:

User shall not communicate any content -- including voice, text, software, images, sounds, data, or other information -- that:

1. is unlawful, threatening, abusive, harassing, defamatory, libelous, deceptive, fraudulent, invasive of another's privacy, tortuous, contains explicit or graphic descriptions or accounts of sexual acts (including but not limited to sexual language of a violent or threatening nature directed at another individual or group of individuals), or uses vulgar language;

2. victimizes, harasses, degrades, or intimidates an individual or group of individuals on the basis of religion, gender, sexual orientation, race, ethnicity, age, or disability;

3. infringes on any patent, trademark, trade secret, copyright, right of publicity, or other proprietary right of any party;

4. impersonates any person or entity, including VSP or COV personnel.

7.0 Changes or Termination of Contract

The SI may change or terminate a Third Party User service agreement or any part of it without notice or liability if a change has occurred in the SI agreement with the COV. The COV Project Manager shall approve such change or termination.

If at any time the Third Party User is found to be in violation of the terms of this agreement, the COV has the right to take recourse against the SI as established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 3, 4, and 5.

8.0 Dispute Resolution

Rapid response is important in the resolution of SI/Third Party disputes. Should any disputes arise with respect to the SI/Third Party Agreement, the SI shall act immediately to resolve any such disputes. The SI shall notify the COV Project Manager, within 24 hours, of any such dispute. The SI shall also provide weekly updates, to the COV Project Manager, of its progress toward resolution of any such disputes.

The SI shall, the existence of any SI/Third Party dispute notwithstanding, continue without delay to carry out all their responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV. Should the SI fail to continue to perform its responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV, any additional costs incurred as a result of such failure to perform shall be borne by the SI.

THIRD PARTY USE OF THE

STARS MOBILE DATA NETWORK

1.0 Introduction

This document is intended to establish safeguards and policies to assure that the Commonwealth of Virginia (COV) has primary beneficial use of the statewide Mobile Data Network (MDN) while allowing System Integrator (SI)/Third Party use. Third party use is allowed by other COV governmental entities and organizations to provide a financial benefit to the COV for allowing this additional use. The use of these networks by Federal or Public Service organizations may be allowed with the concurrence of the Commonwealth and the Federal Communications Commission.

Each Third Party User requires a separate SI/Third Party User agreement which assures that this intended use shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 5, 8 and 9.

Fixed site equipment, any impact or use of, is described in the STARS Guidelines for Third Party Site Usage Document.

2.0 Process

A. User Priority

The COV shall allow SI/Third Party User access to and use of the MDN according to the following priority list:

1. COV Public Safety
2. Local Government within the COV
3. Federal Public Safety
4. COV Public Service
5. Non-COV Public Service
6. Commercial

The SI shall enforce the priority listing and manage any Third Party use to assure that the primary mission of the Mobile Data Network is fulfilled (which is to facilitate COV communications). The SI shall demonstrate, by reports submitted quarterly to the COV Project Manager, that these requirements remain in force.

B. Application

Organizations interested in becoming Third Party Users of this system shall submit a proposal to the SI. This proposal shall be reviewed and jointly agreed to by the COV and the SI. Included in this proposal shall be the following:

1. Description of the Third Party
2. Description of the use by the Third Party User (How the LMR Network will support their mission.)
3. Total number of users to be added
4. Existing radio frequencies, licensed by the third party, to be dedicated to this access.
5. A copy for each of FCC licenses for these existing frequencies.
6. Number of mobile computers to be added (including any used in a fixed location.)
7. Anticipated number of messages to be sent and received
8. Expected usage pattern (e.g. two users during the day, one through the evening and night shifts.)
9. Hardware and software to be used for access. This should include make(s) and model(s) for the computer, modem, the radio (if different from the modem) and the type of software to access the system, move message traffic and to perform virus scans.
10. Security measures to meet the requirements of this document.
11. Agreement of the Third Party User to the connection requirements of this document.
12. Full description of potential connections to other databases, servers, or agencies[1] to include the following:
    a) Server and client software, data exchange standard or protocol, average number and length of messages and any encryption that may be employed.

    b) Detailed explanation of the measures that are taken to assure that malicious code is nor propagated from their system into the COV mobile data system. Integral to this statement are the measures taken to apply any vendor software patches, service packs, and security fixes. Also important are continuously operating and frequently updated virus checking software.

[1] While the system is designed to serve a variety of uses and users, it is anticipated that bandwidth limitations or other physical limitations may be restrictive. Not all uses will be approved.

C. Radio Frequency Authorizations

The SI shall provide any waiver or request for special consideration by the Federal Communications Commission (FCC) to the COV Project Manager. The COV Project Manager will submit any such documentation to the FCC. Potential Federal Third Party Users shall obtain the concurrence of the COV Project Manager, of any documentation, prior to it being submitted to the National Telecommunications and Information Administration (NTIA).

3.0 Connection

All Third Party use of the MDN is provided a Quality of Service (QoS) grade of "best effort service." Quality of Service requirements will be established by the COV in any Contract awarded resulting from RFP #2001-035, Section 9.

Third Party Users of the system are expected to provide licensed radio frequencies that are compatible with STARS for this access. Existing COV frequencies shall not be used for third party access to the MDN except as specifically authorized in writing by the COV Project Manager. All costs including transmit and receive hardware, software and any other connection costs are born by the SI or the Third Party User. Any erection of antennas, masts, transmit or receive equipment or any other site modifications shall meet the requirements for that use. These requirements are contained in the requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 8 and 9. The COV shall not be expected to participate in the costs of connecting other frequencies to the MDN.

COV reserves the right to upgrade the MDN. These upgrades may require third parties to modify existing equipment and software or to purchase new equipment or software. The COV shall not be responsible for any third party costs to meet any upgrades. All SI/Third Party User agreements shall contain a warning to Third Party Users that system technology upgrades may be performed without notification and that the Third Party User shall be responsible for any cost changes resulting from these COV technology changes.

Connections shall be established and maintained by the SI. The SI shall be responsible to assure that the connection is not used in excess of what has been agreed to between the SI and the COV Project Manager. Where excessive usage is not reduced or eliminated, the SI (with concurrence from the COV Project Manager) or the COV Project Manager may suspend access for the individual user and or the agency or take other action to mitigate the problem.

Situations may arise where user(s) may be restricted from accessing the system. Whether this situation arises from physical limitations of radio coverage, or other causes, the COV shall not be held responsible.

Where connections to other data services are anticipated, the Third Party User shall provide the following:

A. Documentation that they have authorization to make the connection.
B. The interface and software to facilitate the connection.
C. Detailed assurance that no malicious code, computer virus, or unauthorized access can result from this connection or the use of this connection by any user, authorized or not.

The final authorization for allowing the connection will remain with the COV Project Manager. The COV Project Manager shall retain the authority to deny access to any data source(s), which may cause a problem to the system and/or other users of the system.

The SI shall monitor use of the system and bill the Third Party User according to the service provided. The SI shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, and 13.

4.0 Software and Hardware

The SI shall be responsible to assure that all Third Party User hardware meets the requirements of the system and is acceptable for this application.

Any software used by the Third Party User shall not conflict with SI proprietary and confidential information as protected by applicable intellectual property and other laws. Third Party Users shall neither modify, nor distribute works based on the SI supplied software.

If the SI, at its discretion, provides assistance in installing or using of software or data by any Third Party User of this system, the COV shall not be held liable for any claims resulting from such agreements.

5.0 Security

Third Party User(s) shall be responsible for all activities that occur under any authorized password or account. The SI shall establish and enforce all password access of Third Party User(s). Password(s) shall be handled as confidential. The Third Party User shall immediately (within 24 hours) notify the SI of any unauthorized use of a password or account or any other breach of security. The SI shall take immediate (within 24 hours) action to suspend the suspect account until adequate security can be re-established. The SI shall also immediately (within 24 hours) notify the COV Project Manager of any such breach in security.

Third Party User(s) shall not disrupt the functioning of the COV network, solicit another user's password, or otherwise act in a way that interferes with other users' use. A Third Party User shall not distribute any computer program that damages, detrimentally interferes with, surreptitiously intercepts, or expropriates any system, data, or personal information.

The SI shall not pre-screen, monitor, or edit any Third Party User(s) content. The COV will not pre-screen, monitor, or edit any Third Party User(s) content. The COV will not be held responsible for any harmful, inaccurate, unlawful, or otherwise objectionable content originating with or otherwise obtained through this system.

The Third Party User shall immediately (within 6 hours) notify the SI when a mobile terminal is lost, unaccounted for, or stolen. The SI shall take immediate (within 1 hour of notification) action to suspend the suspect account until the mobile terminal is found and adequate security is re-established. The COV Project Manager shall be notified, within 12 hours, when a mobile terminal is lost, unaccounted for or stolen. Any account associated with that terminal will be suspended, within one hour of notification, until the unit is recovered or until other actions are taken to prevent unauthorized access.

The Third Party User is fully responsible for the safeguarding of any information that may be transmitted to or from their mobile computer. This responsibility will include VCIN and NCIC requirements where applicable.

In addition, the SI shall meet all security requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 4, 5, 8, and 9.

6.0 Other Considerations

Any Third Party User agreeing to use this system, shall agree to the following:

A. User shall not upload, post, or otherwise distribute or facilitate distribution of any content -- including text, communications, software, images, sounds, data, or other information -- that:

1. is unlawful, threatening, abusive, harassing, defamatory, libelous, deceptive, fraudulent, invasive of another's privacy, tortuous, contains explicit or graphic descriptions or accounts of sexual acts (including but not limited to sexual language of a violent or threatening nature directed at another individual or group of individuals), or uses vulgar language;

2. victimizes, harasses, degrades, or intimidates an individual or group of individuals on the basis of religion, gender, sexual orientation, race, ethnicity, age, or disability;

3. infringes on any patent, trademark, trade secret, copyright, right of publicity, or other proprietary right of any party;

4. constitutes unauthorized or unsolicited advertising, junk or bulk e-mail (also known as "Spamming"), chain letters, or any other form of unauthorized solicitation:

5. any form of lottery or gambling including pools;

6. contains software viruses or any other computer code, files, or programs that are designed or intended to disrupt, damage, or limit the functioning of any software, hardware, or telecommunications equipment or to damage or obtain unauthorized access to any data or other information of any third party; or

7. impersonates any person or entity, including VSP or COV personnel.

B. The SI may set limits, including limits on the length of storage of mail and other user content, the number of messages going to or from a user account, the size of messages, and the total amount of storage available to a user. Neither the COV nor the SI are liable for the deletion or loss of messages, other communications, or other content maintained or transmitted.

C. The SI may delete any mail message sent to a Third Party User or by a Third Party User if:

1. the size of the message (including attachments) exceeds 1MB;

2. the size of the message (including attachments) when multiplied by the number of recipients of the message exceeds 1MB;

3. the total of undeleted messages (including attachments) exceed 1MB.

If mail messages are deleted, there is no obligation to notify a Third Party User or the sender of the message deletion. All Third Party use requirements shall meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 8 and 9.

7.0 Changes or Termination

The SI may change or terminate a Third Party User service agreement or any part of it without notice or liability if a change has occurred in the SI agreement with the COV. The COV Project Manager shall approve such change or termination.

If at any time the SI or Third Party User is found to be in violation of the terms of this agreement, the COV has the right to take recourse against the SI as established by the COV in the Contract awarded as a result of RFP #2001-035, including Sections 3, 4, and 5.

8.0 Dispute Resolution

Rapid response is important in the resolution of SI/Third Party disputes. Should any disputes arise with respect to the SI/Third Party Agreement, the SI shall act immediately to resolve any such disputes.

The SI shall notify the COV Project Manager, within 24 hours, of any such dispute. The SI shall also provide weekly updates, to the COV Project Manager, of its progress toward resolution of any such disputes.

The SI shall agree that, the existence of any SI/Third Party dispute notwithstanding, they will continue without delay to carry out all their responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV. Should the SI fail to continue to perform its responsibilities under the Contract awarded as a result of RFP #2001-035 with the COV, any additional costs incurred as a result of such failure to perform shall be borne by the SI.

APPENDIX R

STARS SYSTEM DOCUMENTATION REQUIREMENTS

1.0 INTRODUCTION

This document describes the process that the Systems Integrator shall follow during the course of providing system documentation for the STARS project. The types of documentation to be provided, the format of the system documentation, and the process for transferring system documents between the Systems Integrator, the Commonwealth of Virginia (COV) Project Manager, and the Engineer is described. The documents to be provided shall also meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Section 4.

2.0 CONTENT REQUIREMENTS

This section describes the system documentation that shall be provided by the Systems Integrator. The Systems Integrator shall prepare a complete set of engineering manuals, drawings, tables, and other documents for each individual communications site and for the system as a whole showing the system configuration, equipment configuration, cabling schematic, cabling plan and all other important system elements.

The system documentation shall represent a complete and accurate presentation of the communications system. The initial set of system documentation for a division shall be updated to the point of system acceptance of a division. After system acceptance of a division, updates for that division's system maintenance documentation shall be provided on a quarterly basis, as needed.

The elements that the system documentation shall cover are as follows.

2.1 Transmitter Site, Transportable LMR Site and Disaster Recovery Transportable Site Documentation

The following documentation shall be required for each transmitter and transportable site:

A. Standard operations and maintenance manuals for all equipment that shall be required for the transmitter site. This includes manuals for the transmitter equipment (LMR, MW, and mobile data) as well as manuals for items such as the telecommunications systems, alarm system, shelters, towers (fixed and transportable), tower lights, generators, UPS, HVAC systems, fire suppression systems, grounding system, and lightning arrestor equipment.

B. Programming or configuration files, operating software, and software manuals for the equipment at the transmitter and transportable sites.

C. Listing of fixed equipments, firmware and software with the version or revision numbers in actual use at the transmitter and transportable sites.

D. System diagrams showing "as-built" configurations for all components of the RF, controlling, and transmission systems, along with other support systems at the transmitter and transportable sites. The system diagrams shall contain, at a minimum, detailed cabling and wiring information with cable numbering, termination layout information, and the interconnection relationship between the various system components on-site and off-site. Time and frequency domain plots for antenna systems and RF transmission lines.

E. Level settings, system configurations, equipment configurations, and initial readings for the applicable components at the transmitter and transportable sites.

F. Diagrams showing "as-built" installations of the site and the equipment and components at the transmitter or and transportable site. These include site diagrams, antenna location diagrams, floor plans, wall and ceiling details, equipment rack, UPS, electrical system schematics (commercial power and emergency power systems operating together) and any other diagrams that show physical facilities installations.

G. Engineering calculations for elements such as foundations, tower loads, heat loads, equipment weight loads, electrical power requirements, and microwave path calculations, and microwave path profiles. If required by local building codes, certification by a licensed professional engineer for any structure or system affecting the safety of the general public shall be provided.

H. As-built transmitter site or if applicable, transportable site grounding plans and initial grounding measurements.

I. FCC licenses, FAA licenses, MW coordination data, and other regulatory data for the transmitter and transportable sites.

J. Photographs documenting the transmitter and transportable site facilities, equipment, and installation.

K. Logbook for all work performed at these sites.

L. List of names and telephone numbers of persons responsible for each transmitter and transportable site and of equipment vendors' technical support.

M. Intermodulation analysis.

N. RF emissions paper study for hazards.

2.2 Primary Radio Site (zone controller), Primary & Back-up Control Sites (at SPHQ), Dispatch Control Centers (non-VSP), Intranet and alarm system computer equipment and COV Communication Centers (seven VSP Division Headquarters) Documentation

Primary Radio Site, Dispatch Control Center and COV Communication Center equipment shall be required for each of the Communications Zones (CZ). Primary and Back-up Control Site equipment shall be required for the entire STARS system. Documentation shall be required for each of the Communications Zones and for the entire STARS system.

The following documentation shall be required for each Primary Radio Site, Primary & Back-up Control Site, Dispatch Control Center and COV Communication Center:

A. Standard operations and maintenance manuals for all equipment shall be required for the implementation of all sites. This includes manuals for all aspects of the two-way radio system as well as manuals for items such as the consoles, console switches, control hardware, telephone interconnect, data networks, telecommunications systems, alarm systems, generators, UPS, HVAC systems, fire suppression systems, grounding system, and lightning arrestor equipment.

B. Programming or configuration files, operating software, and software manuals for the equipment used at each Site.

C. Listing of system fixed equipments, firmware and software with the version or revision numbers in actual use at each Site.

D. System diagrams showing "as-built" configurations for all components of the Site equipment along with other support systems and necessary interface hardware. The system diagrams shall contain, at a minimum, detailed cabling and wiring information with cable numbering, termination layout information, and the interconnection relationship between the various system components.

E. Level settings, system configurations, equipment configurations, and initial readings for the applicable components for each Site.

F. Diagrams showing "as-built" installations and the equipment and components for each Site. These include site diagrams, floor plans, wall and ceiling details, equipment rack, UPS, electrical system schematics (commercial power and emergency power systems operating together), and any other diagrams that show physical facilities installation.

G. Engineering calculations, for each Site, for elements such as foundations, heat loads, electrical loads. Local building codes may require certification by a licensed professional engineer for any structure or system affecting the safety of the general public. If required by local building codes, certification by a licensed professional engineer for any structure or system affecting the safety of the general public shall be provided.

H. As-built site grounding plans and initial grounding measurements for each Site.

I. Photographs documenting the site facilities, equipment, and installation for each Site.

J. Logbook for all work performed at each Site.

K. List of names and telephone numbers of persons responsible each Site and of equipment vendors' technical support.

2.3 Subscriber Equipment Documentation

The following documentation shall be required for subscriber equipment:

A. Standard operations and maintenance manuals for all types of user equipment. This includes but not limited to manuals for each type of mobile radio, portable radio, vehicular repeater, mobile computer terminal, portable radio charger, portable radio battery conditioner, and control station or other individual types of equipment provided.

B. Programming or configuration files, operating software, and software manuals for this equipment.

C. Listing of firmware and software with the version or revision numbers in actual use.

D. System diagrams showing "as-built" configurations for all unique user item installations, including but not limited to mobile radios, vehicular repeaters, and control stations.

E. Level settings, system configurations, equipment configurations, and initial readings for the applicable components.

F. As-built site grounding plans and initial grounding measurements for all control station locations and any applicable subscriber equipment installations.

F. FCC licenses data, and other regulatory data for the control station locations and any applicable subscriber equipment installations.

G. Photographs documenting the mobile radio, vehicular repeater, mobile computer terminal, and control station installations.

H. Logbook for all work performed.

2.4 System-Wide Documentation

The following documentation shall be required for the STARS System. The System documentation shall be comprised of documentation unique to the total integration of all the various Communication Zones in the System along with documentation for any System wide networks that are not included in the documentation for any individual zone:

A. Standard operations and maintenance manuals for all equipment shall be required for the implementation of the STARS System wide communications system. This includes top-level manuals for all aspects of the LMR radio system, Microwave Telecommunication system, Mobile Data system and the Wide Area Data Network (Intranet) as well as manuals for items, which apply to the System wide operations such as the System and Network wide controllers, data networks, telecommunications systems, and alarm systems equipment.

B. Programming or configuration files, operating software, and software manuals for the STARS system.

C. Listing of any System wide fixed equipments, firmware and software with the version or revision numbers in actual use.

D. System diagrams showing "as-built" configurations for all components required for System wide operations.

E. Level settings, system configurations, equipment configurations, and initial readings for the applicable System wide components.

F. Diagrams showing "as-built" installations of any system wide equipment and components. These include site diagrams, floor plans, wall and ceiling details, equipment rack, UPS, electrical system schematics (commercial power and emergency power systems operating together), and any other diagrams that show physical facilities installations.

G. As-built site grounding plans and initial grounding measurements as it applies to the necessary System wide equipment.

H. FCC licenses, FAA licenses, and other regulatory data for all System wide equipment.

I. Photographs documenting the System wide site facilities, equipment, and installations.

J. Logbook for all work performed for the System wide components.

K. List of names and telephone numbers of persons responsible for the System wide site/s and of equipment vendors' technical support.

3.0 FORMAT REQUIREMENTS

This section describes the format the Systems Integrator shall use for all system documentation.

3.1 General Format Requirements

The documentation shall be:

A. Initially generated using MS Office 2000 or AutoDesk AutoCAD 2000I. Hand-drawn sketches or text and handwritten text are not acceptable. This includes initial levels recorded during the course of optimizing the system. All recorded field information will be typed before it is placed in the final system maintenance documentation.

Software vendors will release upgrades to the above software programs during the course of this project. The COV Project Manager will consider the use of upgrades to software programs for the system maintenance documentation on a case-by-case basis.

Photographs shall be in the "jpeg" file format. Each photograph shall contain the site name, site number (to be determined as sites are identified), date, and a description of the contents.

B. All documentation create by the Systems Integrator and its subcontractors shall follow the file name format below:

Site Number_Document Title_Vendor Code_Rev. No.#.File Extension

The "Vendor Code" is a three-character acronym that describes the vendor that created the document. All final system maintenance documentation shall be submitted in Adobe Acrobat PDF format.

C. Professionally printed and reproduced. All material is to be clean and legible. Printed drawings shall be on heavyweight paper (24# rating or heavier).

D. Of the same revision level as the equipment or components that it is depicting.

E. Complete and self contained. One set of notebooks shall contain all the information a technician would need to trace through the system and make a repair at the equipment site.

F. Consistent in nomenclature and easy-to-follow. A technician should be able to easily track information from higher-level conceptual system documents to detailed subsystem documents. A technician should also be able to easily track information throughout multiple documents that show the same level of detail.

G. Consistent with the labeling on the equipment it is depicting. The labeling on the equipment, wiring or cabling, and connection points shall match the information in the documentation.

H. Provided in both hard copy and stored on a CD or DVD.

I. Hard copy shall be professionally bound in three-ring binders with section tabs and a table of contents.

3.2 Presentation

Multiple three-ring binders shall be at each site location in the system. There shall be a master index included with the set of binders for each site. The master index shall contain a listing of the documentation located at that site. The following are the requirements for putting the binders together:

A. Binders shall be of a quality grade and contain plastic sleeves in the front and on the bound end of the binders.

B. All documentation that is designated for use at a site shall be bound in a three-ring binder. This includes paper bound and spiral bound manuals. Any manual not already punched for use in a three-ring binder shall be punched if practical. If it is not practical to punch holes in a given document, it should be neatly folded and placed in a clear plastic sleeve and inserted in the binder.

C. Any addendum for a manual shall be included in the three-ring binder with the associated manual.

D. Documentation shall be grouped in logical categories. There shall also be a numbering system for the notebooks at a site. The software manuals and software for the various system components shall be grouped together in their own set of three-ring binders and distributed to the applicable sites. The COV Project Manager and the Engineer will review and approve the groupings and numbering system prior to assembly of the documentation.

E. Sleeves shall be inserted in the front and on the bound end of the three-ring binder and contain the following information: site name, site number (to be determined as sites are identified), notebook number, and the word "Final" to differentiate the site documentation from draft versions. The sleeves shall not be hand written. Print should be in "Microsoft Word" or equal, bold text, in Times New Roman font size 16. Paper shall be stock grade heavier than normal letter grade.

3.3 Drawing Title Block Format

All drawings generated specifically for this system (draft and final versions) shall be produced on ANSI D-size sheets or less (as required by the individual drawing, to produce legible print) and contain a title block.

3.4 Document Header Format

All documentation besides drawings that are generated specifically for this system (draft and final versions) shall contain the following information in the header of each page:

A. Site name and number in the upper left-hand corner.

B. Document title in the top-center.

C. The words "Draft" or "Final" and the revision number in the upper right-hand corner.

The document page labeling requirements described above are not required for standard manuals that come with the equipment.

3.5 Document Footer Format

All documentation besides drawings that are generated specifically for this system (draft and final versions) shall contain the following information in the footer of each page:

A. The words "STARS Project" in the lower left-hand corner.

B. The page number and number of total pages of the document in the lower-center.

C. The document file name in the lower right-hand corner.

D. The document shall also have the revision history at the end.

The document page labeling requirements described above are not required for standard manuals that come with the equipment.

4.0 SUBMITTAL REQUIREMENTS

A. The Systems Integrator shall submit draft system documentation in a consolidated set of notebooks for review and approval by the COV Project Manager and the Engineer that meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Section 4. To facilitate review of the draft system maintenance notebooks, the suggested corrections and modifications conveyed by the COV Project Manager and the Engineer shall be incorporated in tracking, when practical.

B. The Systems Integrator shall provide the number of sets of final system documentation, to meet all requirements established by the COV in the Contract awarded as a result of RFP #2001-035, including Section 4, in hard copy. The soft copy of the final system maintenance documentation shall be submitted on CD/DVD's and all files shall be in the Adobe Acrobat PDF format. There shall be a file folder created on the CD/DVD's for each system maintenance notebook. The file folders shall be grouped together on contiguous CD/DVD's according to the equipment location that the files are addressing. Each CD/DVD shall contain information for only one equipment location.

C. One set of system documentation shall include a complete copy of the software programs, manuals, and licenses for all software used by the system. All software programs and manuals that are required to maintain a site or communications zone is to be grouped together and included with the other copies of the final system maintenance documentation.

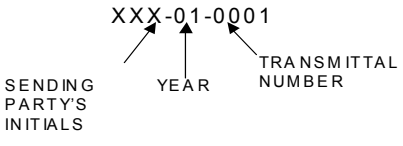
D. Where code has been specifically developed for this project, one complete copy of the source code and the development tools shall be provided with the set that has the software programs and licenses. Also all patches, interim releases, drivers, and dynamic load libraries (DLL) shall be provided. This material is retained in the event that any software becomes corrupt or that unexpected behavior is noted in the system operation. Should this material be proprietary, notification must accompany any response to this solicitation.

5.0 TRACKING REQUIREMENTS

The Systems Integrator, the COV Project Manager, and the Engineer shall each maintain a complete file and record of all system documentation. For this reason, a transmittal system shall be established for the documentation review process. The purpose of the transmittal process is to facilitate the tracking of multiple documents in an efficient manner with minimal effort and time. The following describes the transmittal process:

A. An MS Excel spreadsheet containing a listing of required system documentation shall be established for each phase. The Systems Integrator shall submit the spreadsheet to the COV Project Manager and the Engineer for approval. Once the spreadsheet is approved, draft versions of individual items on the spreadsheet shall be submitted to the COV Project Manager and the Engineer for review and approval. The Engineer will send consolidated comments from the COV Project Manager and the Engineer as documents are reviewed. The Engineer will use the spreadsheet to track the progress of document submission and approvals.

B. The Systems Integrator shall use a transmittal numbering system. Below is the numbering format that shall be used to track transmittals.



The sending party's initials shall always be the same for every transmittal. The year shall be effective only for the duration of the current year and the transmittal number will be sequentially different for each transmittal sent. The following are examples of the transmittal numbering format:

1. COV-01-0025

2. CTA-02-0113

Each party shall be responsible for maintaining a log of sequential transmittals. The Engineer will maintain a master log of all the parties' transmittals. On a monthly basis, a copy of this master log will be forwarded to each party for verification of transmittals that were sent for the previous month.

C. The Systems Integrator shall include a separate transmittal cover sheet for each discreet as-built document. The transmittal cover sheet shall contain the site name and document name from the site documentation spreadsheet to establish which as-built document the transmittal is addressing. This will keep multiple files separated and in order on a per-site basis. Also, if the transmittal is in response to a previous transmittal, the transmittal cover sheet shall contain a reference to that previous transmittal. Each transmittal cover sheet shall be created in Microsoft Word 2000.

D. Official hard-copy (not email) correspondence shall also follow this process with the exception of the cover sheet.