1.3 SCOPE

STARS includes the following:

- An Integrated Voice and Data Statewide Land Mobile Radio (LMR) communication network
  - Interoperability subsystems
- A Mobile Data communication network
  - Premier Mobile Data Computing (and PRC CAD API Support)
  - Automated Vehicle Location and Graphic Geofile Manager with Advanced Tactical Mapping (ATM)
  - Separate Future 700 MHz mobile data network
- An Intranet and Wireless Local Area Network (WLAN)*
  - Wide Area Data Network (WAN)
  - Integration Framework
  - Air Mobile
- Microwave Telecommunication Network (MTS)
  - System alarm and control network
- VSP Communications Centers upgrades
- Two Zone Control Centers
- Network Operation Center
- Migration of Users from existing Networks to STARS

Motorola will develop the transmitter sites, which will include upgraded and/or new towers, shelters, grounding systems, and power systems, required to support the STARS. ***Motorola will also renovate the VSP Communications Centers at Divisions 1, 4, 5, and 7 Headquarters. The Commonwealth will renovate the Network Operations Center (NOC) (Zone 1 Master Site) building and develop the Communications Center (Zone 2 Master Site) at Divisions 6 VSP Headquarters. (Mod. #1 Rev.)*** ~~It will also include the development of the Zone 1 Master Site, upgrading or development of the seven (7) VSP Division Headquarters (including the Zone 2 Master Site located at Division 6).~~ ***(Mod. #1 Rev.)***

***Note:** The 700 MHz data network, Intranet and WLAN are planned Future System Enhancements, described in Section 16.

1.4 MOTOROLA STATUS REPORTS

The Motorola Program Manager or designee will be responsible for delivering status reports to the Commonwealth's Program Director. These reports will be provided on an agreed monthly basis. These status reports will include the following information:

Overall project status compared to scheduled events

- Tasks completed over the last 30 days
- Statement of problem areas that have been resolved and action taken to affect resolution
- Tasks scheduled to be completed over the next 30 days

- Statement of potential problem areas that could hinder the progress of the project
- Updated schedule to be provided when changes occur and not less than monthly

1.6 PROJECT SCHEDULE

The project Gantt chart enclosed in the Contract identifies the projected timeline and responsibilities for completing the required tasks to successfully implement STARS. All days referenced are working days. This schedule will be updated, to include all task associated with the STARS implementation, and mutually agreed upon between the parties within thirty (30) days of the project kickoff meeting. The Motorola schedule will be provided monthly in Microsoft Project or an agreed upon electronic format with the Status Report to the STARS Project Manager.

The Project Schedule is contingent upon the following assumptions:

- Contract start date of ~~**7/1/04**~~ ***7/13/04 (Mod. #1 Rev.)***
- Design and construction of transmitter sites is a continuous effort
- (10) days for customer reviews and approval of routine site design documents (Extensions will be discussed during project meetings and approved by the STARS PD and Motorola Project Manager.)
- Design and implementation of microwave system is a continuous effort
- Design reviews are completed on schedule
- VHF, 700 MHz, 800 MHz, and microwave frequencies are acquired, coordinated, and licensed in time to support initial ordering of equipment
- The Commonwealth has adequate personnel to complete its responsibilities per the project schedule
- The Commonwealth provides boundary surveys and facility documents for Division 1 implementation 30 days after Contract award
- No delays for site acquisition or approvals from state property owners/managers
- The Commonwealth is exempt from zoning – and no delays are encountered based on zoning issues
- No extreme weather conditions or other uncontrollable delays
- No relocation and/or removals of existing equipment and facilities (towers, shelters, etc.) except as specified in this Contract. Subscriber installations begin upon successful completion of functional and coverage ATPs, documentation to follow regarding the installation prototypes
- Refer to Contract Terms and Conditions for Project Delays

Motorola will provide the following fleetmapping engineering services to develop the actual STARS subscriber radio and console fleetmap structure. The overall 10-step process to accomplish this will be as follows:

Step 1: Document System Technical Information
Step 2: Document System Operation Information
Step 3: Develop Fleetmaps of STARS Participating Agencies
Step 4: Create Fleetmap Structure
Step 5: Develop System Partitioning
Step 6: Update Trunked Data Repository (TDR)
Step 7: Review Contract Loading Analysis
Step 8: Assign Final Aliases and IDs
Step 9: Create Radio Templates
Step 10: Create Console Templates

Motorola will provide the STARS Project Manager a copy of the documentation created after each of the above steps.

A Fleetmapping Responsibility Matrix is included in Table 1-2, which outlines each party's role in completing the above process.

1.16 ELECTROMAGNETIC EMISSIONS (EME)

The Commonwealth, instead of Motorola, is responsible for all required analysis, posting, process development, and implementation of EME safety plans. (Mod. #1 Rev.) ~~Commonwealth sites that Motorola develops or improves will be designed, protected, and posted to limit exposure to Electromagnetic Emissions (EME) from Commonwealth sites in accordance with CFR 47, CFR 29 Sections 1904, 1910, and 1926 [OSHA], and the Commonwealth RF Radiation Exposure Compliance Plan. Motorola will conduct an analysis of the Motorola provided equipment, conduct paper study evaluations and develop an EME safety plan. All information will be properly documented and archived. Personnel, when required as part of the EME safety plan, will wear personal RF energy monitors. Motorola will develop the training protocols or administrative procedures necessary to comply with applicable Federal regulations. Motorola's responsibility under this paragraph is limited to sites and installations that are part of the Motorola system design in this Contract. Motorola will only be responsible for bringing these Commonwealth sites into compliance. If the expected levels exceed approved levels due to other than STARS installed equipment, it will be the responsibility of others to bring their sites and installations into compliance~~. ***(Mod. #1 Rev.)***

1.18.3 NOC and Zone 1 Master Site Building Renovation

The Commonwealth ~~Motorola~~ ***(Mod. #1 Rev.)*** will develop a complete and functional Zone 1 Master Site. The site will contain the Zone Controller network equipment for one of the two zones. ~~The design and renovation of this building will be conducted using a Fast Track scheduling method; both Motorola and the Commonwealth will need to follow this scheduling method in order to meet the implementation schedule which includes rapid turn around on all communications, correspondence, and request regarding construction at these sites. The Commonwealth will provide Motorola with a Substantial Completion approval upon the Commonwealth taking beneficial occupancy of that building. Warranty for the building and its facilities will begin at this time. Specific information for this scope of work can be found in the Master Sites and VSP Communications Centers Section of the Contract.~~ ***(Mod. #1 Rev.) The Commonwealth's completion of the Zone 1 Master Site, to the point of beneficial occupancy by Motorola, must be in accordance with the Project Schedule. (Mod. #1 Rev.)***

1.18.4 VSP Communication Center Renovation/Construction

Motorola will renovate ~~six (6)~~ ***four (4) (Mod. #1 Rev.)*** existing Virginia State Police Communication Centers per the drawings provided by the Commonwealth. These drawings can be found in the Master Sites and VSP Communication Centers Section of the Contract**.** ***The Commonwealth will build a new (Mod. #1 Rev.)*** Division 6 facility***, which (Mod. #1 Rev.)*** will be a ~~new,~~ ***(Mod. #1 Rev.)*** standalone building that incorporates the Division 6 Communications Center and the Zone 2 Master Site. ***The Commonwealth's completion of the new Division 6 facility, to the point of beneficial occupancy by Motorola, must be in accordance with the current Project Schedule (Mod. #1 Rev.)*** The design and construction of these buildings will be conducted using a Fast Track scheduling method; both Motorola and the Commonwealth will need to follow this scheduling method in order to meet the implementation schedule. The Commonwealth will provide Motorola with a Substantial Completion approval of each building upon the Commonwealth taking beneficial occupancy of the renovated area or new building. Warranty for the building and its facilities will begin at this time. Specific information for this scope of work can be found in the VSP Control and Communication Centers Section of the Contract.

1.18.5 Mobile Dispatch Trailer

Motorola will provide ~~two (2)~~ ***one (1) (Mod. #1 Rev.)*** Mobile Dispatch trailer~~s~~ ***(Mod. #1 Rev.)*** to support the renovation process at the VSP Division HQs. ~~These~~ ***This*** trailer~~s~~ ***(Mod. #1 Rev.)*** will be utilized to provide temporary dispatching facilities for the VSP dispatchers while their facilities are being renovated.

The Commonwealth will be responsible for providing and installing all communication equipment required to continue dispatching its personnel. The Commonwealth will be responsible for providing adequate space for parking the trailer within reasonable proximity of the existing facility to allow for inter-connection to the existing equipment. The Commonwealth is responsible for providing adequate power within fifty (50) feet of the trailer, and for all utility usage costs. The trailer will be configured to include a communication room for the installation of two (2) dispatcher and two (2) call taker positions, a location to place the G-Link equipment, and a rack space for placement of miscellaneous servers and printers. The trailer will also include

When integrating a new system into an existing facility, Motorola will separate new wiring from any previously installed wiring when practical. Motorola will not use existing conduit containing electrical power for communication cabling runs.

1.21 Integrated Voice and Data

Motorola will be responsible for the installation of the IV&D subsystem fixed network equipment (FNE). This equipment will include the transmitter site equipment, dispatch subsystems, Master Site equipment, and all ancillary equipment and systems such as the dispatch phone ~~and video conferencing systems~~ ***(Mod. #1 Rev.)***, as described in the Contract. The Commonwealth will provide information concerning existing fiber optic cabling and access to the fiber optic system.

1.21.1 Console Installation

Motorola will replace the existing furniture and console equipment at the seven (7) Commonwealth State Police Divisional Dispatch Centers. The replacement of this equipment will correspond with the renovation of each of the Division HQs. The Non-VSP dispatch facilities included in the STARS will utilize their existing console furniture, but will receive new console dispatching equipment.

1.21.2 Console Furniture

Motorola will coordinate with the Commonwealth Program Director or designee to determine the final room layouts for the console furniture installations. Motorola will provide the Commonwealth Program Director examples of the various colors available for the final laminate, fabric, and edge treatments for the console furniture.

1.21.3 Installation of Console Equipment

Motorola will install all new console equipment into the console furniture at all dispatch facilities as identified in the Contract. All cabling will be properly dressed and provide a minimum of 5' of slack to allow some movement of the equipment. All cabling will include appropriate labeling at each end. All cabling will be labeled at both ends and all demarcation information properly documented. All racks for the Central Electronics Bank (CEB) will be securely fastened to the floor. All equipment will be properly grounded per Motorola's R56 Standards and Guidelines.

1.22 Microwave Telecommunications

Motorola will provide, install, and optimize the microwave telecommunication subsystem. Motorola will adhere to the same installation and optimization practices as stated for the other subsystems.

Antenna systems, with radomes, elliptical wave guide and wave guide attachment, mounting and pressurization parts and hardware will be furnished for all microwave links. Antenna systems will meet all requirements of the CFR 47 as of the date of the Contract.

1.24.4 Equipment Space and Facilities

With the exception of installation locations where Motorola is responsible for site improvements, the Commonwealth will be responsible for providing adequate space, power, grounding, and environmental conditions per Motorola's R56 Standards and Guidelines to support the Motorola supplied equipment. The Commonwealth will be responsible for providing the cable pathways required to run the cables between equipment and/or communication links.

The Commonwealth will be responsible for providing any required telephone dial-up lines, and TCP/IP communication links to any existing networks, workstations, and printers that are to have access to the applications. The Commonwealth will be responsible for verifying proper operation of these communication links and interfaces. Termination of these interfaces will be at a demarcation point within 15' of the Motorola provided equipment. Motorola will be provided dial-in access to all development and system "root" accounts on all servers running Motorola licensed software.

1.24.5 Installation and Configuration

Motorola will work with the Commonwealth to place the equipment in a maintenance accessible location. All cabling will be labeled at both ends and all demarcation information properly documented. All installed cabling will comply with national and local codes. All Ethernet cabling will be rated for Category 6 and plenum rated where applicable. Appropriate surge suppression will be provided to protect critical network communications and storage devices. All equipment will be properly grounded per the revised Motorola's R56 Standards and Guidelines. Motorola will configure the client software and interfaces based on the design documents (FSD, ICD, and CRF) approved by the Commonwealth.

1.25 In-Tunnel Antenna Systems

Motorola will provide, install, and optimize an in-tunnel antenna solution at six (6) tunnel facilities. The tunnels are the Big Walker tunnel, the East River Mountain tunnel, the Elizabeth River Downtown and Midtown tunnels, the Hampton Roads tunnel, and the Monitor Merrimack tunnel.

1.25.1 Tunnel Installation Overview

Motorola will coordinate tunnel installations with the appropriate VDOT District Office personnel. The installation will be performed **between 7:00 PM and 5:00 AM EST, Sunday through Thursday, on consecutive days with the exception of a 3-day weekend for a major holiday** ~~between 12:00 AM and 5:00 AM EST on consecutive evenings,Monday through Thursday,~~ ***(Mod. #1 Rev.)*** or at such other time as may be arranged between Motorola and VDOT. **In case of a major holiday weekend, there cannot be any lane closures until the night of the first business day following the holiday**. ***(Mod. #1 Rev.)*** If through no fault of Motorola, or its subcontractors, if access is not provided on a continuous basis for the full shift time specified, Motorola will be provided a day-for-day schedule and cost relief, and reallocation of a full work shift for each full work shift not allocated or other wise not provided to Motorola or its subcontractors.

1.26 CONTROL STATION INSTALLATIONS

Motorola will install control station radios as identified in this contract.

1.26.1 Electrical and Grounding

With the exception of where Motorola is responsible for site improvements, the Commonwealth will be responsible for providing a dedicated 15-amp, 3-wire 120 VAC circuit with earth/facility system ground within 15' of the control station. The Commonwealth is responsible for providing an appropriate grounding source for the control station location.

1.26.2 RF Cabling

Motorola will install the RF cabling for the control stations. The Andrew cabling will be properly connectorized with Andrew products, grounded, and will be run via the least obtrusive way to the outdoor antenna location. Motorola has included an average of 100' of coax per antenna installation. This will include up to a maximum of four (4) wall penetrations. No core drilling or custom wire molding is included in this scope. Distances greater than 100' are outside this scope and can be quoted on a case-by-case basis. ~~Motorola~~ ***The Commonwealth (Mod. #1 Rev.)*** will provide ***an appropriate antenna mounting structure for the installation of the coax and antenna that will also provide sufficient height to support RF coverage for the control stations. (Mod. #1 Rev.)*** ~~will provide 100 50-foot wooden utility poles for the installation of the coax and antenna.~~ ***(Mod. #1 Rev.)*** ~~The Commonwealth is responsible for ensuring that there is appropriate space and clearance for placement of the wooden pole.~~ ***(Mod #1 Rev.)***

1.27 SYSTEM OPTIMIZATION

Motorola will verify that all equipment is operating properly and that all levels are properly set once installation in the field is complete. Motorola and its subcontractors will optimize each subsystem individually. All audio and data levels will be checked to verify factory settings. Any necessary changes will be made to the appropriate settings. All radio equipment will have forward and reflected power checked after connection to the antenna systems to verify that they