



**Homeland  
Security**

**Science and Technology**

# Summary

**U.S. Department of Homeland Security**



**System Assessment and Validation for Emergency Responders**

The U.S. Department of Homeland Security (DHS) established the System Assessment and Validation for Emergency Responders (SAVER) Program to assist emergency responders making procurement decisions.

Located within the Science and Technology Directorate (S&T) of DHS, the SAVER Program conducts objective operational tests on commercial equipment and systems and provides those results along with other relevant equipment information to the emergency response community in an operationally useful form. SAVER provides information on equipment that falls within the categories listed in the DHS Authorized Equipment List (AEL).

The SAVER Program is supported by a network of technical agents who perform assessment and validation activities. Further, SAVER focuses primarily on two main questions for the emergency responder community: "What equipment is available?" and "How does it perform?"

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## Mobile Communications Centers Comprehensive Report

Mobile communications centers are essential during a critical incident or a planned event. Numerous vendors provide deployable communication centers in various forms and with diverse capabilities. However, these centers are not a one size fits all solution. This, emergency responders must mix and match communication assets based on their needs and budget constraints. Many already have a sizable investment in their deployability communications capability and are simply looking to add new technology to the assets they already possesses. Others are looking at purchasing mobile communication center capabilities, but do not know how to turn their operational requirements into equipment purchases.



In order to provide emergency responders with information on mobile communications centers, mobile communications vehicular packages, and current and emerging interoperable voice communication technologies, the Space and Naval Warfare Systems Center, Charleston (SPAWARSYCEN) put together the Mobile Communications Centers (MCC) Comprehensive Report. The MCC report assists emergency responders in their decision to acquire mobile communications assets based on their organizational requirements.

This is a summary of the contents of the MCC report. The report should be reviewed for the full discussion and recommendations. The complete report can be found on the SAVER Web site.

### Procurement Process

The MCC report provides a roadmap for procuring a mobile communications vehicle. It provides insight on maintaining a healthy relationship with the project stake-holders, managing the inherent issues that may arise, and tracking the project requirements from inception to fruition. The report also identifies proven project controls and planning tools that can be applied to any size project.

Figure 1 illustrates common phases of the project and a typical sequence of events. Please note that the tools described in the report may not apply too all projects and the sequence of events may vary depending on the timeline and magnitude of the task.

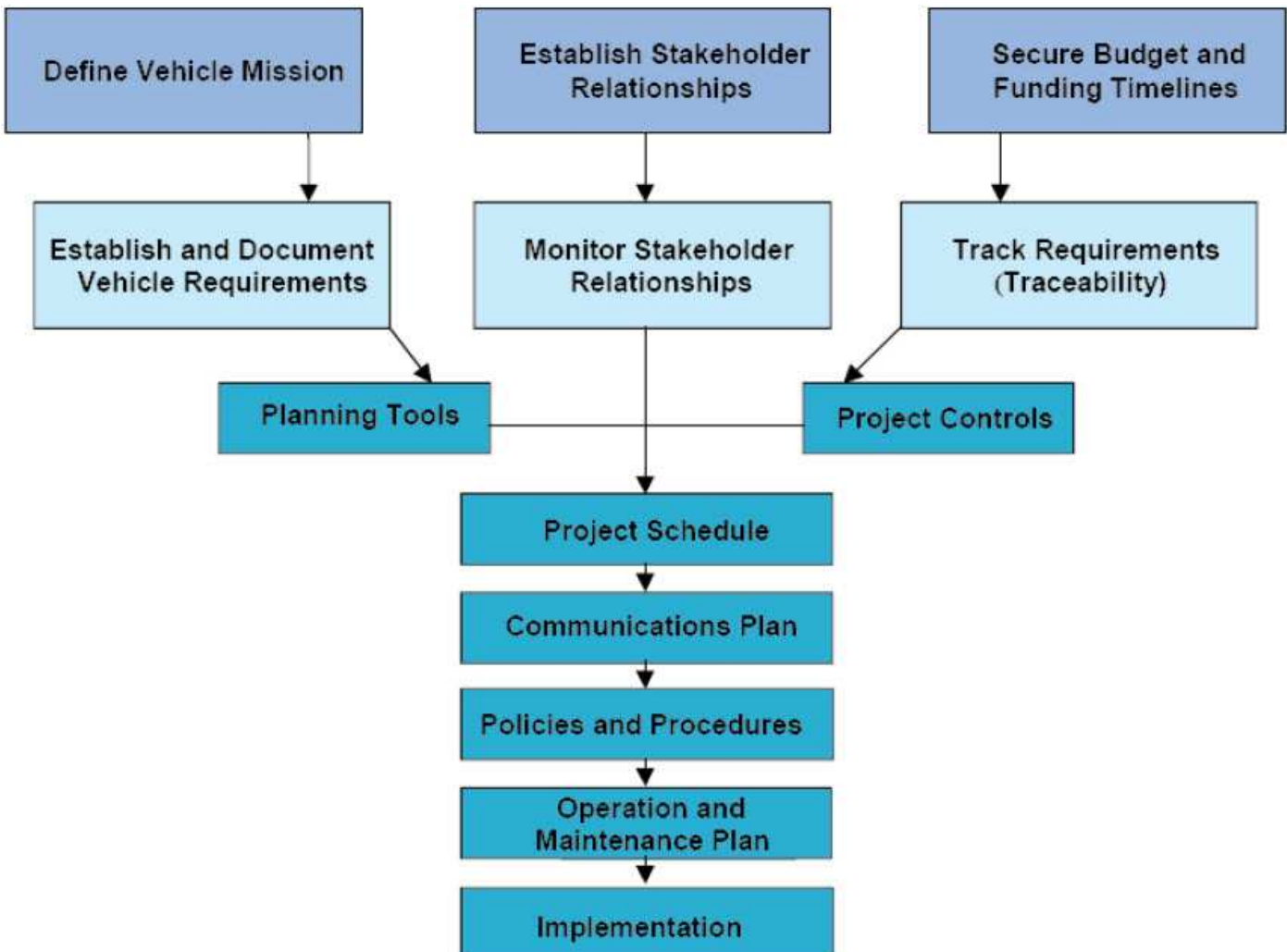


Figure 1. Procurement Process Flowchart.

### ***Define Vehicle Mission***

Every vehicle must have a purpose or mission. Defining the mission and developing a mission statement for the new vehicle are critical steps towards a successful project and procurement strategy. The mission should be a clear, concise statement that explains why the vehicle exists and what functions it would perform in the future.

### ***Review Mission Types***

When defining the vehicle's mission, consider every situation the vehicle may support. This exercise may identify other procurement options, including partnering with other agencies. Partnering can expand the vehicle's functionality and usefulness to other domains. It can also identify and secure additional resources. Also, consider how frequently the vehicle may be used. A vehicle designed for light, infrequent use may differ greatly in price and design from one that will be deployed weekly.

### ***Identity Stakeholders***

Stakeholders are the people or organizations who have a vested interest in the environment, performance, and/or outcome of the project. Identifying stakeholders is a primary task because all the important decisions during the initiation, planning, and execution stages of the project are made by these stakeholders. Each stakeholder has an essential contribution to make and stakeholder expectations need to be addressed. Stakeholders typically include the project leader, project team members, sponsor, project customer, functional manager, project champion(s), and program owner.

### ***Understand Ownership Issues***

Defining the vehicle's ownership, especially one intended to serve the public and satisfy the needs of multiple agencies, has inherent complexity. Ideally,

a single agency would secure funding, define the vehicle's mission, identify the requirements, and deliver the new vehicle on time and under budget. Unfortunately, this is not usually the case.

### ***Consider Deployment Conditions and Scenarios***

Emergency responder entities already have policies and procedures that vary depending on the situations to which they respond. Mobile communication vehicles enhance the ability to respond to various situations and conditions; therefore, when procuring a vehicle it is essential to conceptualize the situations the vehicle may encounter. Consider the scenarios the vehicle may likely respond to, identify its role in those scenarios, and document the functions it provides and for whom those functions are provided.

### ***Requirements Definition***

After the mission has been clearly defined and the project stakeholders have been identified, the requirements collection process begins. This is perhaps one of the most time consuming tasks of any project in the sense that if the requirements are unclear, there is substantial risk that the vehicle may not meet stakeholder's expectations. The project manager typically oversees the requirements collection phase.

### ***Develop Requirements Specification Document***

The requirements specification document is the consummation of all interviews, meetings, and requirements gathering. It serves as the focal point for all design and engineering efforts and becomes the baseline and measuring tool for testing and acceptance of the final product. Due to its importance, formal guidelines should be followed to document each requirement.

### ***Develop a Requirements Traceability Matrix***

A requirements traceability matrix (RTM) organizes and tracks the requirements established in the requirements specification document. While the foundation for the RTM is developed in the requirements gathering phase, the RTM can be used in a variety of ways throughout the vehicles development life cycle. For example, the RTM can be used in all phases of the project to:

- Compare how various vendors propose to implement the requirements.
- Track whether and how all requirements have been met by vehicle design.
- Identify the similarities and differences in the implementation of the requirements in different states of completion.
- Assist in the development of test scripts for the functional demonstration phase of system testing.

Support the documentation that all vehicle requirements have been met in the acceptance testing phase of the procurement.

### ***Fund and Procurement Options***

When considering funding and procurement options, the emergency responder should seek to maximize the functionality of a mobile communications vehicle while minimizing the purchase cost by:

- Understanding the trade-offs between commercial off-the-shelf (COTS) versus custom purchases.
- Setting up interagency agreements to reduce the number of mobile communications vehicles purchased.

Using partnerships to increase their purchase power.

Some of the funding options include, grants, leasing versus buying, building your own MCC versus buying, commercial off-the-shelf MCCs versus custom built, and partnering with other agencies.

### ***Managing the Project***

Regardless of the funding method(s) and the knowledge, assets, and resources the organization uses, the project manager must create, maintain, and execute a project plan that accounts for the following areas of dependency and risk:

- Resources and Costs.
- Communication.
- Policy.
- Politics.
- Stakeholders buy-in.
- Documentation.

### ***Assign Resources with Costs***

To understand the high-level impact of resource allocations and their estimated cost over time, the project manager should:

- Create a Work Breakdown Structure that includes estimated costs of each resource and calculate over the life cycle of the project.
- Question the vendor regarding their resources and costs over time.
- Research vendor history with outside agencies/states.

Include a reasonable margin for error in calculations.

### ***Determine Project Control***

The manner in which the project manager will monitor progress, control personnel, and mitigate risks is highly dependent on the magnitude of the project and

established standards and protocols. Regardless of the tactics used to manage the project, the project manager and staff should agree to the communications methods used and document the frequency and expectation at the onset. Some areas requiring clarification include the use of telephone conferencing, status reporting (written and verbal), and formal reporting attached to project milestones and contract payments.

### ***Develop a Communications Plan***

The communications plan outlines the participant's roles and responsibilities regarding information review, approval, and dissemination. It also discusses the participant's roles regarding key project processes, events, documents, and milestones. This plan is important because it:

- Helps manage expectations regarding the project.
- Ensures methods used for communication will be most effective.
- Assures appropriate levels of communication with internal and external project stakeholders.

- Provides relevant, accurate, and consistent information at all times.
- Generates and sustains enthusiasm and support for the project.

### ***Develop Policies and Procedures***

Developing policies and procedures regarding the vehicle's deployment and operation is essential in maintaining adequate stakeholder input over the course of the product development through implementation. Ideally, an independent, unbiased party should capture and document the policies and procedures to be adopted for use of the vehicle prior to implementation. Regularly reviewing changes in policy brings to the forefront issues that may prevent the project from succeeding.

### ***Plan for Post Implementations Considerations***

Future recurring costs should be identified as early in the project as possible. As the project matures, additional recurring costs may arise or new costs may be identified. To compensate for these or any other previously understated or unidentified costs, research the following areas, document the results, and track



changes over the life of the project. Remember that the project champion is critical to ensure that funding is and will continue to be available. Often, there are enough resources and funding to build a vehicle; however, it is not necessarily affordable over time.

- Determine if grant funding and/or capital outlays will be available.
- Determine if grants identified for the project have special requirements that may dictate functionality and ownership.

Delineate between cost to purchase and cost to operate and maintain over-time.

### **Mobile Communications Equipment**

There are three mobile platform categories:

1. Motorized – A self-contained vehicle equipped with a gasoline or diesel engine for propulsion. This includes COTS, custom, and military specified vehicles.
2. Trailer – A carried or towable configuration. This configuration requires an additional source of power (i.e., gas or diesel powered vehicle) for mobilization.
3. Vehicle Independent – A solution that is modular and compact in design. It can be deployed via a motorized vehicle, mounted on a trailer, or in a stand-alone configuration (i.e., fly-away box or suitcase).

### ***Mobile Communications Technology Considerations***

The emergency responder's function in the community varies from one incident to the next, so do their incident communications range requirements. The following are a sample list of the many various types:

- Crowd control (demonstrators, sports events, evacuations, etc.).
- Cross jurisdiction law enforcement (robberies, drug task force, etc.).
- Multi-jurisdictional mutual aid (large wild land fires, Weapons of Mass Destruction incidents, etc.).
- Emergency coordination (post natural disaster clean-ups).

Emergency responders rely heavily on voice communications, typically via frequency modulated (FM) radios. Most emergency responder radios operate on frequencies in four major bands of the spectrum, 20, 150, 450, and 900 MHz. During an emergency, most call groups are tied together, but it soon becomes apparent that bridging these call groups on a single channel creates congestion. There are several items involving user numbers that should be considered before determining the number of interoperable channels.

- Count how many users will be using the channel in each call group.
- Perform drills and exercises that saturate the channel(s).
- Test alternative communications for low priority calls.
- Size your system relative to the number of users.

### ***Interoperability Considerations***

Interoperability can be defined as the ability of any emergency responder to talk with whomever they need to, whenever they need to, when properly authorized- but does not mean that everyone needs to be connected to everything.

Communications interoperability is essential to the members of the emergency responder community, during times of emergency and disaster. These incidents bring together a wide variety of experts and professionals, depending on the situation. No one-size fits all communications interoperability solution exists, as individual agency equipment, procedures, and training vary greatly within the emergency responder community. Technology alone cannot solve the interoperability problem; however, agencies working together with a common vision backed by agreements and policies can.

### **Lessons Learned**

The MCC report contains a section that provides a collection of quotations from end-users who procure, maintain, and operate mobile communication center within the emergency responder community. Its intent is to help the reader avoid the repetition of past failures by sharing observations and best practices. The quotations were collected from a geographically diverse cross-section of end-users. The lessons learned section of the MCC report contains comments pertaining to the following subjects.

- The Project- project planning, control requirements and general observations.
- Communications considerations- interoperability and communications planning.
- Common terminology – verbal communications between agencies.

Equipment and resources – sizing, scalability, environmental controls, resources, and operational considerations.

### ***Workbook Section***

The workbook section of the MCC report provides organizations with a starting point where they can

identify, analyze, prioritize, and rank decision factors relative to selecting a mobile communications center. The workbook is comprised of several worksheets that may help an organization make decisions regarding equipment, vendors, resources, and acquisitions. The worksheets are especially useful for looking at a large number of decision factors and assessing each factor's relative importance.

The workbook should be used during the planning phase of the project. It will establish a decision framework to help select products and services and determine strategies and communication methods for project statuses. The individual worksheets can also be used as supporting documentation during and after the procurement process. The MCC report includes the following worksheets:

- Equipment worksheet.
- Vendor worksheet.
- Equipment priority worksheet.
- Acquisition worksheet.



## **Products**

The remaining portion of the MCC report consists of brief summaries of the MCC products available on the market. The information was gathered from the vendors and published as provided. The report contains information on point of contact, product description, company information and industry experience, equipment cost range, and existing customer lists.

The full report can be found on the SAVER Web site along with other SPAWARSYSCEN reports dealing with the mobile communications centers project.

For more information on the mobile communications centers project please see the SAVER Web site or contact the SAVER Program Support Office.