# TABLE OF CONTENTS

# TABLE OF FIGURES



# TABLE OF TABLES

# 1. EXECUTIVE SUMMARY

L.R. Kimball respectfully submits this report and recommendations for interoperability for the Southeast Michigan (SEMI) Urban Area Security Initiative (UASI) region.

Pursuant to L.R. Kimball's contract with the SEMI UASI, this report analyzes results of the data collection pertaining to public safety agency radio communications systems in the SEMI UASI to identify the types of systems within the region, as well as identify any interoperability gaps within the region, and makes recommendations to mitigate the interoperability gaps and provide approximate costs of those recommendations.

This document is a comprehensive report identifying the systems and technologies in place in each county in the region, analyzing the findings of L.R. Kimball's research to identify interoperability gaps and issues.

Based on analysis results of the information gathered and the interoperability gaps identified, L.R. Kimball has developed recommendations for technology and operational elements for improving radio communications interoperability in the region. For each potential technology or migration alternative identified, a preliminary estimate of costs has been provided. Recommendations for technology alternatives for closing the identified current interoperability gaps are identified and explained. The recommendations and potential approaches consider current user day-to-day interoperability needs, as well as the capabilities needed to support large-scale incidents or disasters involving numerous responding agencies. Other considerations applied to development of potential solutions include the following:

- Interoperability on a local and regional basis
- Alignment with surrounding regional plans and state of Michigan's Statewide Interoperable Communications Plan (SCIP)
- Leverage existing resources (systems/sites/connectivity) to the extent possible
- Analysis of frequency spectrum and availability
- SAFECOM program recommendations and Department of Homeland Security (DHS) guidelines for funding eligibility
- Industry standards and trends (e.g., Project 25 [P25] compliance)

## 1.1 Major Findings

The following are the major findings of L.R. Kimball's research and analysis of public safety communications systems in the UASI.

### 1.1.1 Overview of Radio System in the UASI

Within the SEMI UASI, there has been a concerted effort to migrate public safety agencies to a single shared radio system—the Michigan Public Safety Communications System (MPSCS). Local agencies and counties have built out the MPSCS infrastructure to provide enhanced local coverage and capacity. Much of the build out of MPSCS infrastructure in the UASI has been in the form of developing simulcast cells on the system. The first was the city of Detroit, which has a ten-site simulcast cell. More recently Monroe, Macomb, St. Clair, and Washtenaw Counties have built out MPSCS simulcast cells in their counties by adding tower sites and contributing their Federal

Communications Commission (FCC) licensed frequencies to MPSCS. Some counties have moved their public safety voice communications almost entirely on to MPSCS, while others have moved the majority of agencies to this shared system.

Oakland County is the exception to the migration to MPSCS. Oakland County has a shared 800 MHz digital trunked radio system, known as OakWIN, which utilizes Harris Communications' OpenSky® technology.

Numerous other multi-agency and multi-jurisdictional 800 MHz shared trunked radio systems are in the UASI. Only one of these systems is P25 standards-based—the city of Warren system. Others are older proprietary Motorola systems that are reaching the end of their technology life cycle. There are larger conventional UHF systems in the cities of Southfield in Oakland County and Dearborn in Wayne County. In Wayne County, there are also a number of small VHF conventional systems.

### 1.1.2 Interoperability Issues and Gaps

The following are the major interoperability issues and gaps identified by L.R. Kimball:

1. MPSCS has provided users with the optimal technology to support interoperability in Macomb County, Monroe County, Washtenaw County, St. Clair County, the city of Detroit, and portions of Wayne County. This is a shared standards-based (P25) system that meets the highest level of interoperability on the DHS Interoperability Continuum.
2. Oakland County's OakWIN system has provided public safety users in Oakland County with a shared system that supports a high level of interoperability within Oakland County. The technology used by the OakWIN system is proprietary and is incompatible with MPSCS's technology. This has caused serious interoperability problems between Oakland County users and MPSCS users. The city of Southfield is not on the OakWIN system. Southfield continues to use an Ultra high frequency (UHF) conventional analog radio system.
3. All counties in the UASI have some interoperability problems within their county and/or with agencies outside of their county due to disparate frequency bands and technologies used by various agencies.
4. Macomb County has two primary radio systems—the Macomb MPSCS and the city of Warren's trunked radio system. Although both are P25 compliant systems, they are not interconnected and channels from each system must be programmed into the other system's subscriber radios. Warren's access to MPSCS talkgroups is limited due to MPSCS's user fee structure.
5. Monroe County is surrounded by a number of jurisdictions that use conventional analog radio systems and non-P25 compliant trunking technologies. Monroe County also borders the state of Ohio. Monroe County has addressed its interoperability needs primarily through the use of a fixed interoperable gateway at the Monroe County Central Dispatch Center.
6. Oakland County has serious interoperability challenges because of the incompatibility of the trunking technology used by OakWIN and that used by MPSCS. Oakland County has addressed these challenges primarily through the use a fixed interoperable gateway. The gateway provides permanent audio patches between three MPSCS talkgroups and three OakWIN talkgroups. There are also five patchable OakWIN talkgroups that can be patched to any MPSCS talkgroups in the Livingston County 9-1-1 Central Dispatch consoles or the Michigan State Police (MSP) Detroit dispatch center's consoles. Oakland County must also

use patched talkgroups and the gateway to communicate with public safety users in the cities of Southfield and Warren.

7. Oakland County faces three primary interoperability problems.
    a. Day-to-day Interoperability Requirements—Interoperability with neighboring jurisdictions outside of the county requires use of patched talkgroups. Dispatch channels of neighboring agencies cannot be monitored or programmed into an agency's radios due to the disparate technologies.
    b. Interoperability with Outside Agencies Responding to Incidents in Oakland County—MPSCS users responding to incidents in Oakland County have limited coverage on the MPSCS in Oakland County due to a minimal number of MPSCS towers in the county.
    c. Interoperability for OakWIN Users Responding to Incidents Outside of Oakland County—When OakWIN users must respond outside of the OakWIN coverage area, they do not have direct access to MPSCS users. They must rely upon on-scene operations using national mutual aid channels. OakWIN radios can be programmed with P25 software for approximately $500 per radio and can have limited access to MPSCS channels at no charge. Only a few OakWIN radios are currently so programmed.
8. St. Clair County has all of its public safety users and many non-public safety users on the St. Clair County MPSCS. St. Clair is surrounded by a number of jurisdictions that use conventional analog radio systems and non-P25 compliant trunking technologies. St. Clair County also borders Canada and currently has no radio interoperability with Canadian public safety agencies. This was identified as the most serious interoperability problem facing the county.
9. Washtenaw County has moved all of it public safety users except the University of Michigan's Department of Public Safety to the Washtenaw County MPSCS. Washtenaw County is surrounded by numerous jurisdictions that use conventional analog radio systems in different frequency bands and non-P25 compliant trunking technologies. In addition, the public services of the County and the city of Ann Arbor remain on the legacy 800 MHz analogy trunked system. The University of Michigan also maintains it own 800 MHz analog trunked system.
10. Wayne County has the least consolidated county radio systems in the region. There are six public safety shared systems and MPSCS sub-systems in the county: 1) Detroit MPSCS; 2) Conference of Eastern Wayne (Grosse Pointe area); 3) Western Wayne Mutual Aid; 4) Downriver Mutual Aid; 5) Wayne County MPSCS; and 6) the State's MPSCS infrastructure. A number of municipalities in the county have contracted directly with the MPSCS for service. The city of Livonia is transitioning from a shared Harris EDACS® trunked radio system to MPSCS and will use a single site on the MPSCS. The Metropolitan Airport Authority maintains its own P25 trunked radio system. Numerous non-public safety agencies participate in these shared systems, thus providing interoperability with public safety agencies. All of these systems are 800 MHz trunked radio systems, although they currently use both analog and digital technologies. There are various conventional analog systems used by public safety agencies in Wayne County, including the city of Dearborn's UHF system and numerous Very high frequency (VHF) High Band systems.
11. Wayne County is currently transitioning to a two-site MPSCS simulcast sub-system. The County has a plan to build out MPSCS countywide to support all public safety users in the county. This will require migrating all of the existing systems onto MPSCS, including the Metropolitan Airport system. This would provide a single shared standards-based system in Wayne County.
12. All 800 MHz subscriber radios in Wayne County were upgraded to be P25 capable. Those subscribers that are not primary users of the MPSCS have Level 1 access to MPSCS and all ICALL/ITAC channels for interoperability.

13. In addition to the disparate radios systems currently used in Wayne County, the city of Detroit is also adjacent to the city of Windsor, Ontario, Canada, with bridges and tunnels connecting the two cities. Currently, there is no radio interoperability between Windsor's trunked radio system and the Detroit MPSCS.
14. St. Clair and Wayne Counties have interoperability needs with Canadian public safety. Currently the only radio interoperability with Canada is through the use of the 800 MHz national mutual aid channels and this is in jeopardy due to rebanding of these channels in the United States. There is no radio interoperability in St. Clair County with Canadian authorities. Two DHS Border Interoperability Demonstration Project (BIDP) grant proposals were submitted within the region, both of which would establish gateway connections between radio systems in the two countries. On May 2, 2011, DHS announced approval of the *Southeast Michigan Border Interoperability Solution Project*, one of the two grant proposals.
15. Infrastructure to Support National Mutual Aid Channels. MPSCS provides statewide coverage on the ICALL hailing channel. MPSCS has very limited ITAC infrastructure. The MPSCS and local agencies have made the decision not to build any additional ITAC repeaters. There is no VHF or UHF mutual aid infrastructure in the UASI. The UASI relies primarily upon mobile radios in mobile communications units (MCUs) (i.e., mobile command posts) to support on-scene communications on mutual aid channels.
16. Deployable Interoperability Infrastructure. Although there are numerous MCUs equipped with mobile radios on various frequency bands, these MCUs are primarily mobile command posts used for on-scene incident management. The only deployable interoperable mutual aid infrastructure with base stations and repeaters is maintained by Oakland County's Mutual Aid Box Alarm System (MABAS) Division 3201 Communications Support Team (CST). MPSCS can deploy a well-equipped communications site on wheels (SOW) from Lansing.
17. The only structured CST with equipment and personnel to staff an Incident Command System (ICS) communications unit for a major incident is the MABAS Division 3201 CST.
18. A number of personnel have been trained as Communications Unit Leaders (COMLs) in the SEMI UASI, but only those associated with the MABAS Division 3201 CST are part of a structured unit for incident support.
19. There has been little dissemination of the SEMI UASI Tactical Interoperable Communications Plan (TICP) and limited development of TICPs and interoperable standard operating procedures (SOPs) at the local level.
20. Training and exercises in the use of interoperable communications resources varies from jurisdiction to jurisdiction. There is a consensus that additional training is needed throughout the UASI for dispatch personnel and emergency responders in the use of interoperable resources. Personnel staffing MCUs for incident management need to be better trained in the use of mobile gateways and other interoperable resources.

## 1.2 Major Recommendations

The following are the major recommendations for addressing the interoperability gaps identified in the SEMI UASI.

1. Provide a single shared standards-based radio system for all emergency responders in Wayne County that will provide interoperability both within the county and with surrounding jurisdictions. This will require the build out of the MPSCS infrastructure in Wayne County and should include:
    a. Merging the existing Detroit Metropolitan Airport P25 trunked radio system into the Wayne MPSCS sub-system
    b. Migrating all existing public safety radio systems in Wayne County onto MPSCS

2. Any new radio systems in the UASI should be P25 compliant shared systems.
3. MPSCS and other P25 systems in the UASI should be interconnected using the radio frequency (RF) Inter Sub-system Interface (ISSI).
4. Provide an MPSCS radio console to the Oakland County Sheriff's Central Dispatch to enable Oakland to initiate its own patches between MPSCS talkgroups and OakWIN talkgroups. Redesign the gateway connection as necessary to facilitate this change.
5. Install P25 software in selected radios in Oakland County and provide MPSCS access for these radios to permit interoperability with MPSCS users.
6. Encourage the development of county-level interoperability governance structures to promote agency-level participation in interoperability governance. Encourage counties to develop county-level TICPs based on the regional TICP.
7. Review and adopt DHS model SOPs for use of regional interoperable resources and encourage their adoption by agencies to govern the use of gateways, use of console patches, and the operation and maintenance of radio caches.
8. Encourage the development of dispatcher and emergency responder training programs based on the UASI TICP and adopted SOPs.
9. Train additional COMLs in the UASI and involve the COMLs in structured incident response systems and support them in the COML certification process. Encourage all agencies operating MCUs to have at least two certified COMLs available for deployment with the MCU.
10. Assess the costs and benefits of having additional deployable mutual aid infrastructure in the form of an SOW equipped with antenna mast, mutual aid repeaters and base stations, gateway, and console.
11. Encourage the development of a second CST in the region or expansion of the existing MABAS CST to provide communications support to two major incidents in the UASI simultaneously.
12. Require that any radio equipment funded by the UASI have sufficient channel capacity to program all VHF High Band, UHF, and 800 MHz national mutual aid channels and require that they be programmed with these channels. Standardized channel names should be used for all national mutual aid channels when programmed into subscriber equipment.
13. Encourage all VHF High Band and UHF users in the UASI to add the national mutual aid channels during any reprogramming required prior to January 1, 2013 to transition to narrowband operation.
14. Program all mobile radios used in MCUs with gateway devices for on-scene incident management with all national mutual aid channels, Michigan "common" channels, Michigan MABAS channels, and all Hospital Emergency Radio Network (HERN) and UHF MED channels.
15. Require that all cache radios approved for use in the UASI be programmed with all national mutual aid channels, Michigan "common" channels, Michigan MABAS channels, and all HERN and UHF MED channels.
16. Work with the Region 21 700 MHz Regional Planning Committee to develop a prioritized list of 700 MHz national mutual aid channels to be used for interoperability in the UASI.
17. Encourage emergency managers to include communications unit personnel in all multi-agency, multi-jurisdictional and multi-discipline training and exercises.
18. Each county and agency maintaining a dispatch center should ensure proper training of dispatch personnel in interoperability SOPs and use of available resources.
19. Regular drills should be scheduled to allow personnel to use interoperable communications equipment and to test the functionality of the equipment.
20. A full functional exercise to test and exercise the SEMI UASI TICP should be conducted. Additional functional exercises in each county and the city of Detroit are desirable to permit more individual agency participation in a functional exercise.

21. Request MPSCS to consider the costs and benefits of adding a tower site in the Pontiac area to improve MPSCS coverage in Oakland County.

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# 2. BACKGROUND

In June 2010, the SEMI UASI awarded a contract to L.R. Kimball to conduct an assessment of the existing public safety communications systems in the SEMI UASI region and to make recommendations for improving interoperable communications in the region.

As part of this project, L.R. Kimball collected the required data pertaining to public safety radio systems in the UASI to be entered into DHS's Communications Asset Survey and Mapping (CASM) database. This information was collected through a combination of focus group interviews, on-site interviews, and written surveys. L.R. Kimball staff entered all relevant data into the CASM tool. This was completed in January 2011.

Concurrent with this period of the project, L.R. Kimball was contracted by the UASI to collect data for non-public safety radio systems in the UASI, identify interoperability gaps relating to non-public safety systems, and make recommendations for improving interoperability between public safety and non-public safety users. As part of that project, L.R. Kimball entered data for non-public safety communications systems into the CASM database. Also, included in the scope of work for that project, L.R. Kimball updated the SEMI UASI's TICP using the CASM data collected in both projects.

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# 3. METHODOLOGY

To gather data for this project, L.R. Kimball relied upon the data gathered as part of a related project funded through Oakland County. In the related project, L.R. Kimball updated the regional TICP. To update the TICP, representatives from L.R. Kimball met with radio system administrators throughout the UASI. Data was collected for the TICP through a combination of surveys and focus group meetings. Using the TICP data, L.R. Kimball was able to gain an understanding of existing systems in the UASI and identify interoperability gaps.

L.R. Kimball also met extensively with sub-committee members of the Interoperability Committee, who are leading this project, to understand the needs of the region and to identify interoperability gaps. Focus group meetings were held with public safety answering point (PSAP) administrators and public safety leaders to gain an understanding of existing radio systems and their needs.

Pursuant to this project specifically, L.R. Kimball performed the following tasks:
:

- Performed a county-by-county survey of the agency/entity public safety radio communications systems and assets currently in use
- Conducted focus group meetings with representatives that included police, fire, emergency medical services (EMS) and dispatch in the various counties to collected operational and related information
- Conducted surveys and interviews to capture a high-level understanding of the following information:
  - Inputs on operational needs relative to interoperability, current operational capabilities and areas requiring improvement or resolution due to deficiencies noted in the current systems that may impact interoperability
  - Current radio system equipment and configuration, including any special interfaces or accessories, options, age and general condition
  - The entity or agency's short- or long-term goals for system migration and interoperability (i.e., P25 trunked system or maintain current or independent system)
  - Current frequencies utilized by each jurisdiction and discipline and related issues or concerns (FCC narrowband mandate, interference, loading, etc.)
  - Any special or unique system coverage issues, current and future coverage requirements, (locations, buildings, etc.) and coverage deficiencies noted in the current systems that may impact interoperability
  - Any special or unique dispatch-related issues impacting interoperability, current and future performance / capacity requirements
- Developed a preliminary understanding of future system operational and inter-operational issues, features and equipment requirements

L.R. Kimball surveyed surrounding regional plans related to interoperability to develop a high-level understanding of current communications and interoperability plans and capabilities in each, and any future plans for interoperability solutions that may impact the SEMI UASI. L.R. Kimball reviewed the Michigan SCIP and related Public Safety Interoperable Communications (PSIC) grant projects to assure that any recommendations to SEMI UASI are consistent with the overall strategies underway in the state.

L.R. Kimball compiled and analyzed the data gathered from the system assessments, site visits, user surveys and focus group interviews. The focus of the analysis was to develop a general understanding of the current state of public safety radio communications within the region and in each county. In particular, the analysis focused on developing a thorough understanding of the current interoperability gaps and deficiencies that exist on a county and regional level.

The results of this analysis are documented in this report and have been used to develop recommendations for the region for potential approaches to improving public safety radio communications interoperability.

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# 4. INTEROPERABILITY CONTINUUM—A FRAMEWORK FOR UNDERSTANDING INTEROPERABLE COMMUNICATIONS

One of the goals of any emergency communications system is to provide interoperability for emergency response personnel. This is a critical element of any strategic plan for a public safety communications system. For this reason, it is worth providing an overview of the current standards for interoperability that have been set forth by the federal government. These standards and goals should be used by state and local governments in planning and designing communications system. They are also the standards that are used by the federal grant programs to support interoperable communications.

The tragic events of September 11 clarified the critical importance of effective emergency responder communications systems. The lack of emergency response interoperability is a long-standing, complex, and costly problem with many impediments to overcome.

SAFECOM is a federal program that provides research, development, testing and evaluation, guidance, tools, and templates on communications-related issues to local, tribal, state, and federal emergency response agencies working to improve emergency response through more effective and efficient interoperable wireless communications.

In general, interoperability refers to the ability of emergency responders to work seamlessly with other systems or products without any special effort. Wireless communications interoperability specifically refers to the ability of emergency response officials to share information via voice and data signal on demand, in real-time, when needed, and as authorized. For example, when communications systems are interoperable, police and firefighters responding to a routine incident can talk to each other to coordinate efforts. Communications interoperability also makes it possible for emergency response agencies responding to catastrophic accidents or disasters to work effectively together. Finally, it allows emergency response personnel to maximize resources in planning for major predictable events or for disaster relief and recovery efforts.

Tactical interoperable communications is defined as the rapid provision of on-scene, incident-based mission critical voice communications among all first-responder agencies (EMS, fire and law enforcement), as appropriate for the incident, and in support of an ICS.

There are a variety of challenges to interoperability: some technical, some financial, and some from human factors, such as inadequate planning and lack of awareness of the importance of interoperability.

SAFECOM developed an interoperability model consisting of an Interoperability Continuum that sets goals in five elements considered essential to achieving effective interoperable communications—Governance, Standard Operating Procedures, Technology, Training and Exercises, and Usage. The goals in this continuum have been incorporated into guidelines and requirements for federal funding designated for interoperable communications.

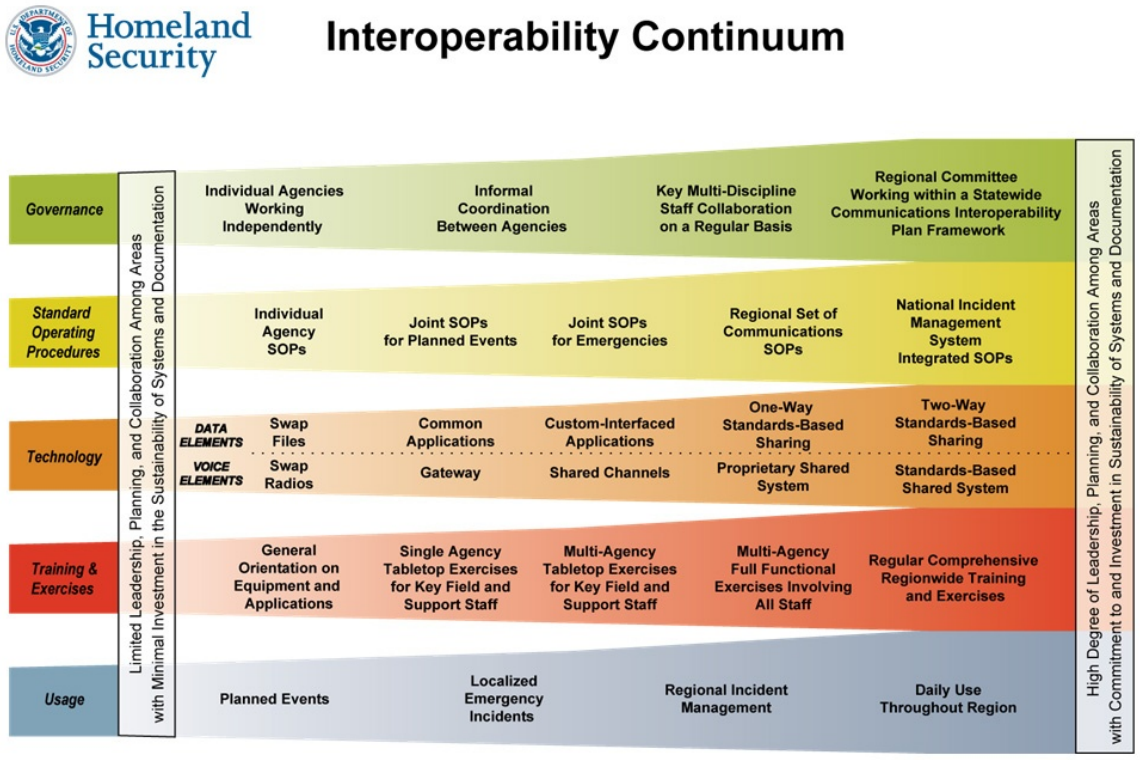


Figure 1 – SAFECOM Interoperability Continuum

SAFECOM's Interoperability Continuum is designed to help the emergency response community and local, tribal, state, and federal policy makers address critical elements for success as they plan and implement interoperability solutions. The Continuum was established to depict the core facets of interoperability according to the stated needs and challenges of the emergency response community and will aid emergency responders and policy makers in their short- and long-term interoperability efforts.

Making progress in all aspects of interoperability is essential as the elements are interdependent. To gain a true picture of a region's interoperability, progress along all five elements of the Continuum must be considered together. For example, when a region procures new equipment, the region should plan training and conduct exercises to make the best use of that equipment.

This report uses the framework of the Interoperability Continuum to assess interoperable communications in the SEMI UASI.

# 5. FINDINGS AND ANALYSIS

## 5.1 Existing Public Safety Communications Systems

Within the SEMI UASI, there has been a concerted effort to migrate public safety agencies to a single shared radio system—the MPSCS. MPSCS is the state of Michigan's 800 MHz digital P25 compliant trunked radio system. The system is managed and maintained by the Michigan Office of Information Technology. It is the largest public safety communications system in the nation, with approximately 231 towers and approximately 54,000 subscriber radios. User fees are imposed to help maintain the system and agencies buy their own subscriber equipment. The system is designed for statewide mobile coverage. Local agencies and counties can build out the MPSCS infrastructure to provide enhanced local coverage and capacity. Much of the build out of MPSCS infrastructure in the UASI has been in the form of developing simulcast cells on the system. The first was the city of Detroit, which has a ten-site simulcast cell. More recently Monroe, Macomb, St. Clair, and Washtenaw Counties have built out MPSCS simulcast cells in their respective counties by adding tower sites and contributing their FCC-licensed frequencies to MPSCS. Some counties have moved their public safety voice communications almost entirely on to MPSCS, while others have moved the majority of agencies to this shared system.

Oakland County is the exception to the migration to MPSCS. Oakland County has a shared 800 MHz digital trunked radio system, known as OakWIN, which utilizes Harris Communications' OpenSky® technology. OpenSky® is a proprietary Internet Protocol (IP)–based technology that uses a spectrally efficient protocol known as time division multiple access (TDMA), which allows two or four voice paths over one RF channel. The technology also supports the use of both "high profile" sites with high channel capacity and "low profile" cell sites to fill in coverage holes that have limited channel capacity. Low profile sites do not require large towers; they may be mounted on top of buildings and utility poles. The OpenSky® architecture is similar to that used by cellular telephones.

Numerous other multi-agency and multi-jurisdictional 800 MHz shared trunked radio systems are in the UASI. Only one of these systems is P25 standards-based—the city of Warren system. Others are older proprietary Motorola systems that are reaching the end of their technology life cycle. There are larger conventional UHF systems in the cities of Southfield in Oakland County and Dearborn in Wayne County. In Wayne County, there are also a number of small VHF conventional systems.

## 5.2 Macomb County

### 5.2.1 Macomb County Radio Systems

Macomb County has two primary public safety radio systems—the Macomb County MPSCS simulcast sub-system and the city of Warren's 800 MHz P25 trunked radio system. Macomb County has constructed a nine-site 18-channel simulcast cell on MPSCS. The city of Warren operates a single-site seven-channel P25 compliant trunked radio system that serves public safety and municipal service users in the cities of Warren and Centerline. VHF frequencies are used for fire paging and EMS dispatching.

All hospitals in Macomb County have radios on the Macomb County MPSCS and radios on the MPSCS talkgroups assigned to the Region 2 North Healthcare Coalition. A substantial number of the public works agencies in Macomb

County are also on the Macomb County MPSCS. All hospitals also have VHF radios on the HERN 155.340 MHz and 155.400 MHz channels. All EMS services in the county have radios on the Macomb County MPSCS, as well as VHF radios on the HERN channels. EMS services in Macomb County are dispatched on a VHF radio channel.

Macomb County has borders with St. Clair, Lapeer, Oakland, and Wayne Counties. St. Clair County has moved all of its public safety agencies to a Macomb County MPSCS simulcast sub-system, which has facilitated interoperability with St. Clair County. Lapeer County is currently making plans to migrate to a similar county MPSCS sub-system that will provide a common shared system between Macomb and Lapeer Counties. The municipalities that border Macomb County in Wayne County are the city of Detroit and the six Grosse Pointe communities. As indicated above, the city of Detroit agencies are MPSCS users. The Grosse Pointe communities share a Motorola non-P25 digital trunked radio system.

Interoperability with Oakland County public safety agencies is complicated by Oakland County's use of the proprietary OpenSky® technology. Oakland County's NetworkFirst® interoperable gateway is the primary means of interoperability between Macomb County MPSCS users and Oakland County agencies.

The city of Warren is the third largest city in the state. The small city of Centerline is surrounded by the city of Warren. Warren has a P25 Motorola trunked radio system that is shared by the cities of Warren and Centerline. Because the Warren system and the Macomb MPSCS system are both P25 compliant, their subscriber radios are able to be programmed on each system. This has been the primary solution to provide interoperability between these systems. Macomb County radios have been programmed with Warren's primary dispatch channels, while Warren's subscribers have only Level 1 access to MPSCS channels. Programming MPSCS talkgroups in Warren's radios is constrained by MPSCS's fee structure (see Appendix C–MPSCS Fee Structure). Level 1 access is free to non-MPSCS agencies. This is a source of some frustration among non-MPSCS system users. The Level 1 access is generally limited to the MPSCS Event talkgroups that must be activated by the Network Communications Center (NCC) for use in events and incidents. Thus, they are of limited value in meeting day-to-day interoperability needs. This will be a constraint that is applicable to system-to-system interoperability between MPSCS users and other P25 systems constructed in the UASI even though the subscriber units can operate on any P25 system.

### 5.2.2 Macomb County Dispatch Centers

There are 12 PSAPs in Macomb County. The cities of Eastpointe, Roseville and St. Clair Shores recently consolidated their dispatch centers.

### 5.2.3 Macomb County Interoperability Problems

Macomb County and the city of Warren have provided shared standards-based systems for all public safety users in the county. As indicated above, there are some limitations associated with sharing talkgroups between the two systems—MPSCS and Warren. The primary technological impediment to effective interoperability is incompatibility of the technologies used by the OakWIN system and MPSCS. This problem has primarily been addressed using Oakland County's Harris NetworkFirst® interoperable gateway to permanently patch three MPSCS talkgroups to OakWIN talkgroups.

Some non-public safety agencies in Macomb County have migrated onto MPSCS, particularly public works agencies. It is desirable that this continue so that interoperability between public safety and public works agencies is established.

## 5.3 Monroe County

### 5.3.1 Monroe County Radio Systems

Monroe County has built out a five-site ten-channel MPSCS simulcast cell. All county public safety agencies and numerous non-public safety agencies share the system. The Monroe County MPSCS sub-system shares a tower site with Lucas County, Ohio; the tower site is located in Lucas County. An MPSCS radio at this tower site is patched to the Lucas County P25 trunked radio system. An MPSCS talkgroup is used to interconnect users in Monroe County with Lucas County agencies.

Fire paging is done on a VHF channel.

The Monroe Mercy Hospital has a radio on the Monroe County MPSCS and a radio on the MPSCS talkgroups assigned to the Region 2 South Healthcare Coalition. The hospital also has a VHF radio on the HERN 155.340 MHz and 155.400 MHz channels. The county's only EMS service—Monroe Community Ambulance—is dispatched by the Huron Valley Ambulance Service in Washtenaw County. Two air ambulance services serve Monroe County—the University of Michigan's Survival Flight and the Toledo, Ohio-based Life Flight, both of which have MPSCS and HERN capabilities.

### 5.3.2 Monroe County Dispatch Centers

The Monroe County Central Dispatch is the PSAP in Monroe County. The center dispatches all police and fire calls. EMS calls are dispatched by Huron Valley Ambulance in Ann Arbor.

The Monroe County Central Dispatch uses a Raytheon ACU-1000® interoperable gateway to connect fixed bases and control stations on several non-public safety systems, including the Monroe Public Schools Transportation UHF system, Jefferson Schools Transportation VHF, Lenawee County Sheriff's Office VHF, a marine band radio for the U.S. Coast Guard and MPSCS talkgroups. The gateway is interfaced with the console.

### 5.3.3 Monroe County Interoperability Problems

Monroe County has addressed its interoperability issues through the use of the patches and interoperable gateways described above. The only direct access to the state of Ohio's 800 MHz statewide trunked radio system, known as the Multi-agency Communications Radio System (MARCS), is through a mobile radio assigned to the Sheriff's Office marine patrol.

Other agencies with which Monroe County has no direct radio interoperability include agencies in Wayne County, primarily communities on the 800 MHz Downriver Mutual Aid System. However, all Downriver Mutual Aid System subscriber radios do have MPSCS Level 1 access, giving them access to MPSCS Event talkgroups for interoperability with MPSCS users. The Downriver Mutual Aid System users also have the ICALL/ITAC channels for on-scene incident operations.

Although many non-public safety agencies in Monroe County participate in the Monroe County MPSCS, it would be desirable to bring additional non-public safety agencies onto the system.

## 5.4 Oakland County

### 5.4.1 Radio Systems

Oakland County has three primary radio systems: 1) the 800 MHz digital trunked system known as OakWIN and described above; 2) the city of Southfield's UHF (420 MHz) system; and 3) the Lake Orion Fire Department VHF system.

OakWIN, operated by the Oakland County Courts and Law Enforcement Management Information System (CLEMIS) is solely a public safety communications system that includes hospitals. EMS and hospitals in the county use hospital-specific talkgroups on the system for ambulance-to-hospital patient care coordination. The OakWIN system uses Harris Communications OpenSky® TDMA proprietary technology, which is incompatible with conventional and trunked radio systems in surrounding jurisdictions. As a result, the County has had to employ a variety of gateway solutions to interconnect public safety agencies with agencies from surrounding jurisdictions.

### 5.4.2 OakWIN Gateway

The Oakland County OpenSky® digital trunked 800 MHz system is capable of interoperability with radio systems from different radio manufacturers, even if these systems are analog, conventional, or on different frequency bands, utilizing a Harris Communications product known as NetworkFirst®. NetworkFirst® consists of a series of gateways and digital voice unit cards that take audio from these disparate radio systems, digitize it into IP packets, and send it across the OAKNet fiber network.

Oakland County OpenSky® users may utilize specific talkgroups for interoperability with three other radio systems: the city of Southfield UHF system, the city of Warren 800 MHz system, and the MPSCS. MPSCS is used by the MSP, other state agencies, and agencies in adjacent counties (Genesee, Lapeer, Livingston, and Macomb) and the city of Detroit.

Interoperability may be used as set forth below.

### 5.4.3 MPSCS Interconnect

MPSCS has established eight talkgroups that provide connection between the OakWIN system and the MPSCS. Three talkgroups (63P911–Police, 63F911–Fire, and 63OAKH–EMS) are permanently patched between the MPSCS and OakWIN. Talkgroup 63OAKH is monitored at all hospitals in Oakland County and one hospital in Genesee County. This provides access to any hospital by an EMS agency on MPSCS with this talkgroup programmed.

The remaining five talk paths must be activated as needed by MSP dispatch in Detroit or the Livingston County Central Dispatch through a telephone call, Law Enforcement Information Network (LEIN) message, or radio call on 63P911 or 63F911 requesting activation. These talk paths appear in all Oakland County OpenSky® consoles and in the Interop profile of every OakWIN radio. Once activated, these talk paths may be patched to the appropriate

OpenSky® talkgroup by an Oakland County PSAP and to an appropriate MPSCS talkgroup by the Livingston County 9-1-1 Central Dispatch or MSP Detroit dispatch center. These remaining five talk paths are available to law enforcement, fire, and EMS for interoperability with MPSCS users.

Patching to MPSCS talkgroups is primarily done by the Livingston County 9-1-1 Center because they still use circuit-based Motorola consoles that support the current engineering for the five patchable talkgroups (63MPSC1-P, 63MPSC2-P, 63MPSC3-P, 63MPSC4-P, and 63MPSC5-P) that can be patch to any MPSCS available in the dispatch center's console. The MSP Detroit dispatch center can also initiate these patches. A diagram of the Oakland County NetworkFirst® to MPSCS gateway is found in Appendix A—Oakland County NetworkFirst® Interoperable Gateway Design.

### 5.4.4 City of Southfield Interconnect

The Southfield Police Department PSAP monitors the OakWIN "ALLDISP" and SFLD1 talkgroups. OakWIN users may be contact the Southfield PSAP in the same manner as any other Oakland County PSAPs using these talkgroups. The Southfield PSAP may patch any Southfield conventional channel to the SFLD1 talkgroup to provide interoperability. Additionally, the Southfield PSAP has access to various OpenSky® fire and police talkgroups. These talkgroups do not appear in the Southfield subscriber radios; the Southfield PSAP must patch the Southfield units to the appropriate OpenSky® talkgroup for interoperability.

### 5.4.5 City of Warren Interconnect

The OpenSky® talkgroup WARN_1 is used to contact the Warren Police Department PSAP, which monitors this talkgroup. Oakland County PSAPs immediately adjacent to Warren, i.e., Hazel Park, Madison Heights, and Troy, are encouraged to also monitor this talkgroup. This talkgroup appears in all of the Warren police and fire radios for unit–to–unit interoperability without the need for dispatch to initiate a patch.

The OpenSky® talkgroup WARN_2 is a secondary talkgroup for interoperability with Warren. This talkgroup is not monitored by the Warren PSAP and does not appear in the Warren field unit radios. For Warren to activate this talkgroup, an Oakland County user or PSAP must contact the Warren PSAP; the Warren PSAP will then patch this talkgroup to an appropriate Warren conventional channel for the event.

### 5.4.6 Control Stations for Gateway Interconnects

Another gateway solution being implemented by Oakland County for communities on the eastern border of Oakland County to provide interoperability with agencies in Macomb County is the use of control stations to access the other county's system and establish a gateway interconnect with a talkgroup on the other system. Ten MPSCS control stations have been installed and connected to the OakWIN system through the NetworkFirst® gateway. This arrangement will be fully implemented by June 1, 2011. Memoranda of Understandings (MOUs) for participating police and fire agencies have been developed and some limited use is being made of this system-to-system connectivity. This arrangement will allow OakWIN users to have a talkgroup on their radio to monitor and talk on a neighboring Macomb County community's dispatch channel. As installed, Oakland County can monitor Macomb County talkgroups. Macomb County has not initiated a similar project. What is currently installed will allow Oakland and Macomb Counties to talk to each other on the Macomb County agency's talkgroup. In addition, the Troy

dispatch center has three MPSCS control stations that are interfaced into the consoles so they may initiate patches between MPSCS talkgroups and OpenSky® talkgroups.

### 5.4.7 P25 Capable OakWIN Subscriber Radios

All OakWIN portable and mobile radios can be programmed with P25 operating software, which would allow these radios to operate on the MPSCS. To date, only a few radios have been so programmed. The cost of the additional P25 software is approximately $500 per radio. As indicated above, the no-charge MPSCS Level 1 system access provides limited use of the state's system, primarily the Event talkgroups.

It was also noted that switching between a P25 system and the OpenSky® system requires re-booting the radio to operate on the other system. It is not merely a matter of switching channels on the radio's menu or rotating a selector knob.

### 5.4.8 Oakland County Interoperability Gaps

The incompatibility of the OpenSky® technology and the MPSCS P25 technology and conventional systems used in surrounding jurisdictions is a serious obstacle to establishing effective interoperability between Oakland County public safety agencies and agencies in surrounding counties and the city of Southfield.

The county has effectively utilized the Harris NetworkFirst® gateway to provide a variety of gateway solutions for interoperability between OakWIN and MPSCS and the two conventional systems.

The interoperability needs of Oakland County public safety radio users can be categorized into three general situations: 1) the day-to-day needs of agencies to communicate with neighboring jurisdictions; 2) the need to provide interoperability with outside resources that might respond from outside Oakland County in response to a major incident in the county; and 3) the need for Oakland County public safety agencies to communicate with agencies when responding outside of the county in response to major incidents in other areas.

#### *5.4.8.1 Day-to-Day Interoperability Requirements*

The MPSCS permanent patches between the three MPSCS talkgroups and their corresponding OakWIN talkgroups provide a means of communicating directly between properly provisioned MPSCS radios and OakWIN users. These are supplemented by the additional five OakWIN talkgroups that can be patched to any talkgroups in the Livingston County consoles or the MSP Detroit consoles. The gateway interconnects, in most instances, require dispatcher intervention since users are not likely to be scanning the permanently patched interoperability talkgroups. To activate patches between the five patchable OakWIN talkgroups also requires intervention of a second dispatch center. As a result, they are not as useful to users as having direct access to a neighboring agency's dispatch and tactical channels. This has resulted in the interest in using control stations to interconnect dispatch channels using the NetworkFirst® and console patches across the systems as described above.

#### 5.4.8.2 Interoperability with Agencies Responding to Incidents in Oakland County

In circumstances where outside agencies are called into Oakland County to assist either with a major incident or some temporary need including events, there is a need for interoperability between OakWIN users and outside agencies. The most likely responders will be MPSCS users. In such circumstances, two general solutions exist.

One is to use existing MPSCS talkgroups that are permanently patched or can be patched to one of the five patchable OakWIN talkgroups. In these situations, the effectiveness of this solution will depend upon the coverage provided by the MPSCS in Oakland County. The MPSCS coverage in Oakland County is based on the coverage criteria of mobile coverage since the only users in the county currently are state agencies. Predictably, in-street and in-building portable coverage may be inadequate to support MPSCS in Oakland County. In 2008, MSP Troopers were sent to supplement the Pontiac Police Department when city officers were laid off due to budget problems. These Troopers reportedly had to be given OakWIN radios because of the poor portable coverage provided by MPSCS in the city.

Providing improved coverage in Oakland County may not be a high priority for MPSCS. However, given the population density in Oakland County and the potential need to support State resources, as well as MPSCS users from neighboring counties, enhancing MPSCS coverage in Oakland County would seem to be a reasonable MPSCS investment.

A second potential solution for supporting outside 800 MHz users responding to Oakland County would be to add ITAC repeaters at OakWIN tower sites and patching these channels to OakWIN talkgroups. This solution provides limited capacity for outside resources. To provide good coverage to the county may require eight to ten sites to be equipped with ITAC repeaters.

#### 5.4.8.3 Interoperability for OakWIN Users Responding to Incidents Outside of Oakland County

There are occasions when OakWIN users might be called upon to respond to incidents outside of Oakland County. As long as they are within the coverage footprint of the OakWIN system, the gateway interconnect to MPSCS will provide interoperability between OakWIN and MPSCS users. However, should they need to respond beyond their coverage area, OakWIN users currently have only the 800 MHz conventional analog national mutual aid ICALL and ITAC channels. These may be adequate if the incident has communications support to include gateway connectivity between these channels and MPSCS or other local users. There are so few ITAC repeaters in Michigan that agencies cannot depend on using the ITAC infrastructure for incident communications.

One obvious solution is to add P25 software and MPSCS channels to OakWIN radios. As mentioned above, this is an expensive solution, approximately $2,750,000, if all 5,500 OpenSky® radios in the county were programmed with P25 software.

### 5.4.9 Dispatch Centers

Oakland County has 27 PSAPs. These PSAPs dispatch all local police and fire services in the county. The city of Southfield dispatches city police and fire on the city's UHF (420 MHz) radio system. The Lake Orion Police

Department dispatches the Orion Township Fire Department on the fire department's local VHF High Band radio system. All other county police and fire departments are dispatched on OakWIN dispatch channels.

## 5.5 St. Clair County

All St. Clair County public safety agencies and many of its non-public safety agencies, including schools, are on the St. Clair County MPSCS.

### 5.5.1 St. Clair County Radio Systems

St. Clair County has built out a seven-site nine-channel MPSCS simulcast sub-system for the county. As indicated above, all public safety agencies and many non-public safety agencies in St. Clair County are on the St. Clair County MPSCS.

St. Clair County hospitals have radios on the St. Clair County MPSCS and radios on the MPSCS talkgroups assigned to the Region 2 North Healthcare Coalition. The hospital also has a VHF radio on the HERN 155.340 MHz and 155.400 MHz channels.

The city of Port Huron dispatch center has access to the city's public works radio system.

### 5.5.2 St. Clair County Dispatch Centers

There are two PSAP in St. Clair County—the St. Clair County Central Dispatch (Sheriff's Office) and the Clay Township Police dispatch. The St. Clair County Central Dispatch dispatches all public safety services in the county, with the exception of the Clay Township police and fire departments.

### 5.5.3 St. Clair County Interoperability Problems

St. Clair County borders Macomb, Lapeer, and Sanilac Counties in Michigan. As indicated above, interoperability with Macomb County is through the MPSCS. St. Clair County has no direct radio interoperability with Lapeer or Sanilac Counties. Lapeer County is actively working to move to MPSCS, but currently still operates on a legacy 800 MHz analog trunked radio system. Sanilac County agencies use primarily VHF High Band conventional systems. Sanilac County has expressed an interest in moving to MPSCS. The St. Clair County Central Dispatch contacts Lapeer and Sanilac Counties by telephone.

St. Clair County also borders Canada. It has bridges each way to and from Canada and a rail tunnel with Canada. There is currently no interoperability with Canadian authorities. The St. Clair County Central Dispatch must contact the Ontario Provincial Police, Sarnia police and fire departments, and the Lambton County, Ontario, agencies by telephone. Large chemical facilities containing hazardous materials are located across the river in Ontario. Communications for hazardous materials incidents come to St. Clair County Central Dispatch by way of a one-way alert radio.

St. Clair County Central Dispatch has need for communication capabilities with the U.S. Coast Guard as there is no direct radio communications with the U.S. Coast Guard in the area. The St. Clair County Sheriff's Marine Patrol does have marine radio communication with the Coast Guard.

Fire paging in St. Clair County is done on VHF High Band channels.

## 5.6 Washtenaw County

### 5.6.1 Washtenaw County Radio Systems

Washtenaw County has built out a seven-site 12-channel MPSCS simulcast sub-system to serve all Washtenaw County public safety agencies, except the University of Michigan's Department of Public Safety.

Washtenaw County hospitals have radios on the Washtenaw County MPSCS and radios on the MPSCS talkgroups assigned to the Region 2 South Healthcare Coalition. The University of Michigan Health System and Hospitals have several radio systems for internal use. The hospitals also have VHF radios on the HERN 155.340 MHz and 155.400 MHz channels. The University of Michigan Survival Flight air ambulance has MPSCS and HERN capabilities.

The county and the city of Ann Arbor have maintained their single-site 800 MHz legacy analog trunked system to serve all Ann Arbor city services, the Washtenaw County Road Commission, the Pittsfield Township Utilities Department, and the Saline Department of Public Works. The system also serves as a back-up to MPSCS.

The University of Michigan has a three-site 11-channel Motorola Smarten® simulcast analog 800 MHz trunked radio system that provides service for the University's Department of Public Safety, Plant Operations and a number of other campus support services. It provides interoperability between the county public safety agencies and the university and is also used by public safety agencies in the county as a back-up to the MPSCS.

### 5.6.2 Washtenaw County Dispatch Centers

There are eight PSAPs in Washtenaw County:

- Ann Arbor Police Department
- Chelsea Police Department
- Eastern Michigan University
- Milan Police Department
- Pittsfield Township Police Department
- Saline Police Department
- University of Michigan Department of Public Safety
- Washtenaw County Central Dispatch (Sheriff's Office)

Huron Valley Ambulance Services has a dispatch center located in Ann Arbor.

### 5.6.3 Washtenaw County Interoperability Problems

Washtenaw County is surrounded by Wayne, Monroe, Lenawee, Jackson, Ingham, Livingston, and Oakland Counties. Only Monroe and Livingston Counties are on the MPSCS. The other counties use various frequency bands and technologies, including UHF and VHF High Band analog, as well as the OakWIN system. These disparate radio systems complicate interoperability between Washtenaw County and neighboring counties.

The interoperability gaps in Washtenaw County are primarily caused by disparate radio systems. Although the Washtenaw County 800 MHz Back-up (Ann Arbor/Washtenaw 800 MHz analog system) and the University of Michigan's 800 MHz analog trunked radio system provide back-up to public safety agencies on MPSCS, both public safety and non-public safety agencies that remain on these systems do not have access to the MPSCS. It is desirable that in the future all existing users of these systems move to MPSCS and that the older analog systems are abandoned.

## 5.7 Wayne County Radio Systems

Wayne County is today the least consolidated of the six counties with respect to shared radio systems. There are six shared systems in the county: 1) Detroit MPSCS; 2) Conference of Eastern Wayne (Grosse Pointe area); 3) Western Wayne Mutual Aid; 4) Downriver Mutual Aid; 5) Wayne County MPSCS; and 6) MPSCS. A number of municipalities in the county have contracted directly with the MPSCS for service. The city of Livonia is transitioning from a shared Harris EDACS® trunked radio system to MPSCS. The Metropolitan Airport Authority maintains its own P25 trunked radio system. Numerous non-public safety agencies participate in these shared systems, thus providing interoperability with public safety agencies. All these systems are 800 MHz trunked radio systems, although they currently use both analog and digital technologies.

There are various conventional analog systems used by public safety agencies in Wayne County, including the city of Dearborn's UHF system and VHF High Band systems in Canton Township, Van Buren Township, and Sumpter Township. Numerous communities use VHF High Band channels for fire paging.

All 800 MHz radios in Wayne County were upgraded to be P25 capable. Those subscribers that are not primary users of the MPSCS have Level 1 access to MPSCS and all ICALL/ITAC channels for interoperability.

### 5.7.1 Detroit MPSCS

The city of Detroit operates on a ten-site 30-channel simulcast MPSCS sub-system, also referred to as MPSCS Zone 7. This sub-system is also used by the cities of Hamtramck and Highland Park, which are both surrounded by the city of Detroit. In addition to both public safety and non-public safety agencies of the city of Detroit, this sub-system is used by the Wayne County Sheriff's Office.

All city of Detroit public services, except the Department of Transportation, are on the Detroit MPSCS sub-system. As a result, public works in the city of Detroit have interoperability with public safety agencies.

### 5.7.2 Wayne County MPSCS

Wayne County is in the process of migrating from its two-site 800 MHz analog trunked radio system to a two-site simulcast MPSCS sub-system. This system will serve county public services, Emergency Management and Homeland Security, and the Wayne County Health Department. Wayne County Sheriff's Office users will use this system when outside the city of Detroit.

The Wayne County Metropolitan Airport Authority operates a single-site P25 trunked radio system that serves the two airports—Willow Run and Detroit Metropolitan. Airport services and public safety units use this system. Merging the Airport's system with the MPSCS sub-system would achieve several efficiencies. One of the MPSCS towers is

already located at the Metropolitan Airport. Additional frequencies from the Airport's system would assist in meeting the capacity needs to add users to the Wayne County MPSCS sub-system.

To expand the MPSCS sub-system in Wayne County will require more towers to meet the coverage needs of municipalities as well as additional channels. Specifically where additional towers should be located will depend, to some extent, on whether existing 800 MHz trunked systems are migrated onto MPSCS. Some improved coverage in the western edge of county is now provided by new MPSCS sites in Washtenaw County. It is estimated that three additional sites in western Wayne County would be needed to provide an acceptable level of coverage to add local agencies in this part of the county. Additional coverage should be provided to the areas of Sumpter and Van Buren Townships. If Canton Township joins MPSCS, at least one tower will be required. It is unknown whether Canton's existing sites would be suitable. Improved in-building coverage for the cities of Garden City, Dearborn Heights, and Inkster would require another tower in this area of the county. See Appendix E–Existing Wayne County Public Safety Radio Networks.

### 5.7.3 Conference of Eastern Wayne Radio System

The cities of Grosse Pointe, Grosse Pointe Farms, Grosse Pointe Park, Grosse Pointe Shores, Grosse Pointe Woods, and Harper Woods make up the Conference of Eastern Wayne. These communities share a single-site six-channel 800 MHz non-P25 Motorola digital trunked radio system. This system is reaching the end of its technology life cycle and will need to be replaced soon. These communities are located between Macomb County and the city of Detroit and coverage is provided from sites in both of these adjacent jurisdictions from MPSCS. The Conference of Eastern Wayne is considering moving to MPSCS. All Eastern Wayne radios currently have MPSCS Level 1 access.

As Eastern Wayne considers joining MPSCS, it is not clear whether the best design option would be for this system to remain a single-site MPSCS sub-system or to be added to the Detroit simulcast cell. This should be fully explored before any decision is made by these communities.

Within the six Grosse Pointe communities that share the Conference of Eastern Wayne radio system, public works and other local government agencies share the system with public safety, including the East Point Mall.

### 5.7.4 Western Wayne Mutual Aid Radio System

The cities of Westland, Wayne, Garden City, Dearborn Heights, and Inkster make up the Conference of Western Wayne. These communities currently shared a single-site 13-channel Motorola analog trunked system that is also reaching the end of its technological life cycle and needs to be replaced. These communities are considering MPSCS as an option.

### 5.7.5 Downriver Mutual Aid Radio System

The Downriver Mutual Aid Radio System serves the following jurisdictions:

- Melvindale
- River Rouge
- Lincoln Park
- Allen Park

- Ecorse
- Taylor
- Southgate Wyandotte
- Brownstown Township
- Riverview
- Woodhaven
- Trenton
- Grosse Ile Township
- Flat Rock
- Gibraltar
- Rockwood

This system is a four-site 18-channel 800 MHz Motorola analog trunked system. These communities are currently exploring options to replace this aging system.

### 5.7.6 Wayne County Conventional Radio Systems

There are numerous conventional analog systems in Wayne County. The largest is the city of Dearborn's UHF system. At this time, Dearborn has no plans to replace their existing system. Among other conventional systems in the county are the VHF High Band systems in Canton Township, Van Buren Township, and Sumpter Township. Several VHF channels are used for fire paging in the county.

The Hospital Emergency Medical System (HEMS), the medical control authority (MCA) for the western and "downriver" areas of Wayne County, operates an EMS radio system that is used primarily for ambulance-to-hospital coordination. It uses various frequencies, including the statewide VHF HERN channels, UHF MED channels, and MPSCS talkgroups. Within the county, hospitals are either part of the HEMS MCA or the Detroit East MCA. These hospitals all have MPSCS radios provided by the Region 2 South Healthcare Coalition. In addition, some of the hospitals use MPSCS for ambulance-to-hospital patient care coordination. The hospitals also have VHF radios on the HERN 155.340 MHz and 155.400 MHz channels.

### 5.7.7 Wayne County Interoperability Problems

Wayne County is the most populous county in the region and encompasses the city of Detroit. Although Detroit, Wayne County government, the city of Livonia, and a number of other municipalities are now on the shared MPSCS, the county still has disparate radio systems as described above. The city of Detroit is also adjacent to the city of Windsor, Ontario, Canada, with bridges and tunnels connecting the two cities. Currently, there is no radio interoperability between Windsor's trunked radio system and the Detroit MPSCS.

### 5.7.8 Wayne County Dispatch Centers

There are 40 PSAPs in Wayne County, including the city of Detroit, which provides 9-1-1 service to the city of Highland Park.

## 5.8 Interoperability with Canada

Interoperability between SEMI UASI agencies and public safety agencies in Canada is primarily an issue in St. Clair and Wayne Counties where bridges and tunnels connect the United States and Canada. Cross border interoperability is complicated by regulatory constraints cross border propagation. The five 800 MHz mutual aid channels (ICALL and ITAC1-4) have been available for public safety interoperability in both countries. However, Industry Canada, the Canadian equivalent to the FCC, is not rebanding these channels. As a result, when these frequencies are rebanded in Region 21, i.e., moved down 15 MHz, they will no longer correspond to the Canada public safety channels. The state of Michigan requested a waiver from the FCC to continue to use the existing National Public Safety Planning Advisory Committee (NPSPAC) frequencies in subscriber units (mobile and portable) on the former NPSPAC mutual aid channels in the immediate vicinity (approximately five miles) of the common border, and only for cross-border interoperability. These radios would be operated in the "direct" mode (i.e., without intervening United States infrastructure) with their Canadian counterparts or, assuming permission by Canada, operated on Canadian infrastructure. In February, this requested waiver was denied. Unless some other solution is found, the use of NPSPAC mutual aid channels will no longer provide an interoperability solution with Canada post-rebanding.

DHS has the BIDP grant program. Both St. Clair County and the UASI submitted proposals for BIDP grants. Based on information provided to L.R. Kimball, both grant proposals involve gateway interconnecting radio systems between the two countries either by landline or the use of virtual private networks (VPNs) over the Internet.

On May 2, 2011, DHS announced approval of the UASI's *Southeast Michigan Border Interoperability Solution Project*. According to the DHS announcement, the funding for this grant will be approximately $4,000,000. Wayne County will lead this project to improve interoperable communications among federal, state, local, tribal, and international partners by providing state-of-the-art two-way standards-based sharing of infrastructure along and across the international border and other ports of entry between Canada, southeastern Michigan, and Sault Ste. Marie. The project partners, including the city of Detroit; Chippewa, Monroe, and Macomb Counties and several Canadian jurisdictions, will establish common governance structures, exercises, training, and operational plans and procedures. The technical approach includes updating MPSCS towers, installing IP-based communications in two border tunnels, deploying radio caches, and installing gateway equipment. The grant proposed two new MPSCS towers to be located along the Detroit River.

At this time, it appears that interconnecting radio systems using some type of gateway is the most viable solution to providing interoperability between public safety agencies in the two countries. The city of Windsor's 800 MHz trunked radio system is a P25 system. As a result, this system could be interconnected with MPSCS with an ISSI interface. However, ISSI is typically intended to support roaming between two or more systems. The likelihood of users roaming onto the system in the other country is not a likely scenario. Being able to talk across the border is the greater need. This may be accomplished effectively by an IP-enabled audio gateway between the two systems.

## 5.9 Deployable versus Fixed Mutual Aid Infrastructure

MPSCS has installed an NPSPAC ICALL repeater at each MPSCS site (not local sub-system sites) to provide statewide hailing on this channel to region MSP dispatch centers. MPSCS has installed a few ITAC1 repeaters in the SEMI UASI area. MPSCS has made a determination that further investments in mutual aid repeaters are not

justified. Any additional investment in mutual aid repeater infrastructure in the UASI would have to be made by local agencies. Based on interviews with communications leaders in the UASI, there was little interest in adding ITAC repeaters to provide extensive coverage in the region. Two reasons were given to support this position. First the vast majority of 800 MHz users in the region and within the state are MPSCS users who have access to MPSCS infrastructure throughout the region. Even those users of 800 MHz systems other than MPSCS have MPSCS Event channels programmed. It has been reported that there are apparently unlicensed and uncoordinated ITAC repeaters in the Detroit area. This has caused problems when attempting to use the ITAC channels in the repeater mode at incidents. A further complicating factor in constructing ITAC infrastructure is the current uncertainty about whether propagation on the rebanded ICALL/ITAC channels may be limited by Canada's unwillingness to reband these frequencies as public safety interoperability channels. In light of these circumstances, L.R. Kimball does not advocate constructing additional ITAC repeaters within the region.

The construction of VHF High Band and UHF mutual aid infrastructure within the region has likewise not been pursued. The reasons given for not investing in fixed mutual aid base stations and repeaters are similar to those identified above. There are few VHF High Band users remaining in the region and there are only two major UHF systems—Southfield and Dearborn. There are also propagation restrictions on these frequencies into Canada. Again, L.R. Kimball concurs that investing in VHF High Band and UHF mutual aid base stations and repeaters to provide infrastructure coverage throughout the UASI is not the best investment to support interoperable communications at this time.

There is a consensus that effective on-scene incident communications requires the ability to communicate on mutual aid channels on all frequency bands—VHF High Band, UHF and 800 MHz— and to be able to gateway interconnect these channels. In order to support such on-scene communications, it is desirable to have some level of deployable radio infrastructure beyond mobile radios in mobile command posts.

Currently, the only deployable infrastructure in the UASI is the equipment maintained by Oakland County's MABAS Division 3201 CST. The CST operates several specialized apparatus, including a self–contained Field Communications Unit (FCU) and a Tactical Communications Trailer (TCT). CST equipment includes:

- Radio communications interoperability – The team has three ACU–1000s and two Incident Commanders Radio Interfaces (ICRIs) that provide interoperability between disparate radio systems operating on VHF, UHF, 700/800 MHz, analog, digital, and trunked radio systems.
- Incident communications capability – The TCT trailer is equipped with 700/800 MHz repeaters, UHF repeaters, VHF base stations, MPSCS radio and OpenSky®. These communications assets are connected to a console system that permits all repeaters, base stations and radios to be controlled by up to three wireless laptop computers. These repeaters/base stations are capable of operation on all radio channels assigned for public safety interoperability. These communications assets facilitate the establishment of incident-specific communications networks for police and fire incidents.
- Mobile internet access – The unit is equipped with a satellite data communications system that provides uplink and downlink data capability and IP telephone capability. A portable telephone system is utilized to share IP and conventional plain old telephone system (POTS) between up to 16 extension telephones that are equipped with voice mail capability.
- Mobile computer network capability – The unit is equipped with 802.11g wireless network equipment and MOTOMESH networking equipment permitting client laptop computers to communicate with each other,

onboard servers, and the Internet using satellite, wired, or other wireless communications equipment. This network also permits printing and plotting of documents, maps, aerial photos, and other files.

- Mobile video capability – The unit is equipped with four portable and two mast-mounted video cameras, an on-board server and mesh network system that permit the capture of video from an incident scene, recording, and providing access through the Internet to any authorized computer with Internet access.
- Video conference capability – The unit is equipped with a video conference unit capable of interfacing via satellite with any of the video conferencing units currently installed in local public safety facilities and emergency operations centers.
- Satellite telephone, fax, data capability – The unit has a portable BGAN Inmarsat satellite communications system capable of voice, fax, and data communications.
- Equipment Cache – The team maintains the following equipment cache:
  - 11 laptop computers capable of being deployed to utilize the on-scene network with Internet access and Microsoft Office applications.
  - 70 VHF portable radios capable of operating on common VHF interoperability channels (wideband and narrowband) and a discreet portable repeater channel.
  - 1 VHF portable repeater, power supply and antenna capable of rapid deployment in conjunction with the VHF portables listed above.
  - 50 UHF portable radios capable of operating on common UHF interoperability channels.
  - 120 M/A–COM P–5250 multi-mode (Open Sky/MPSCS–P–25/conventional) 700/800 MHz portable radios, battery chargers and accessories. (On order)
  - 1 portable Vehicular Tactical Repeater (VTAC) capable of extending coverage on the OakWIN radio system.

Although the TCT has 800 MHz repeaters, the coverage area for these repeaters is approximately one mile to one and one-half miles radius due to combiner loss because of the frequency spread of the various repeater channels.

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Figure 2 – Oakland County MABAS Division 3201 CST FCU and TCT

In addition, MPSCS can deploy a communications SOW from Lansing that is utilized in cases of emergency and where expanded coverage is required. The site consists of two trailers. The main trailer has a majority of the end user equipment, including a six-channel trunked MPSCS site. Using point-to-point (PTP) microwave links, the SOW trunked site equipment can be linked back into the MPSCS and act as a fully functional wide area site. The SOW has a 60-foot antenna mast.

The main trailer also includes mesh networking equipment. Mesh networks are wireless networks similar to Wi-Fi, but are able to relay data between wireless devices to connect back to the network. If one device is out-of-range of the network equipment at the SOW and another device is within range, the device in range can relay data to the other out-of-range device.

The main trailer also contains an MPSCS dispatch console that can be tied into the system. Once a connection is established between the system and SOW dispatch site, the console can be loaded with whichever talkgroups are needed.

Another additional feature is the MOTOBRIDGE™ gateway device. The MOTOBRIDGE™ can connect a radio from each system together, allowing communications between the two systems. On board the SOW are control stations for UHF, VHF and 800 MHz for patching to the MOTOBRIDGE™.

The second trailer can be used as a PTP relay between an MPSCS tower and the portable SOW site if there is too great a distance between the two towers. It can be utilized if the main SOW trailer cannot make a direct connection to a tower due to obstructions such as natural landscaping and buildings.

Figure 3 – MPSCS Communications SOW

The SOW deploys with MPSCS communications technicians to set up the unit. However, MPSCS does not provide trained COMLs or other communications unit personnel to support operations. It is estimated that it would take three to four hours to deploy to a location in the UASI. To establish a PTP microwave link to the MPSCS would almost certainly take longer.

All other MCUs in the region are typical mobile command posts that are equipped with mobile radios and, in some cases, mobile gateway devices to interconnect the mobile radios for on-scene incident communications.

# 6. RECOMMENDATIONS

L.R. Kimball has provided recommendations that address the key elements of interoperable communications—technology, governance, policies/procedures, and training/exercises.

## 6.1 Governance

As part of a separate project, L.R. Kimball developed a recommended governance structure for the UASI and developed a draft governance charter for the Interoperable Communications Committee (ICC) of the UASI.

To be effective, there must be agency-level stakeholder participation in interoperability governance to ensure that SOPs developed at the state and regional level get communicated to emergency responders and dispatch personnel and that SOPs get incorporated into agency policies/procedures. There is also the need for local and agency level SOPs to be developed for the use of interoperable resources.

L.R. Kimball recommends that governance bodies be developed at the county level. These county-level governance bodies should take the lead in communicating state and regional SOPs to local agencies. They should also develop county TICPs.

A good place to start to develop a county-level governing body is to look at existing groups that already have some responsibilities related to interoperability. These groups might be county communications advisory boards or communications committees within the local emergency management organization. Developing interoperability governance within existing organizational structures may require changes in the group's mission and membership. Existing communications groups may have been established to perform an advisory function to a county communications system or a consolidated 9-1-1 center. As a result, these groups may not include representatives from state and federal agencies.

There will be a need to establish a written agreement among the agencies to define the rights and responsibilities of agencies with respect to interoperability governance just as at the regional level. The written agreement should include a statement of the group's mission or charter. All participating agencies should make a formal commitment to developing multi-agency, multi-jurisdictional and multi-disciplinary plans for the use of interoperable communications assets within the local jurisdiction, typically a county.

Using the DHS model, SOPs provided in Appendix D–Department of Homeland Security Standard Operating Procedure Templates for Interoperable Resources, the SEMI UASI ICC can review and adopt regional SOPs that can be disseminated to the county governance groups. At the county level, the SOPs can be tailored to meet a county's specific needs. The SOPs can be disseminated to individual agencies for adoption by respective agencies, which can also address agency-specific requirements.

### 6.1.1 Interoperability Planning

#### *6.1.1.1 TICPs*

There are two types of planning that should take place within the interoperability governance group—tactical and strategic. Tactical planning looks at what agencies have today and how those resources can most effectively be used. TICPs are operational plans that include SOPs for the use of existing interoperable resources. Those resources may include one or more technological solutions for interoperable communications—radio caches, shared radio channels, interoperable gateways, and shared radio systems. Developing TICPs requires inventorying the assets available within the group's jurisdiction – What are the existing resources that support interoperable communications? Once the resources have been identified, the tactical plan with SOPs for using the resources can be developed.

The TICP, in accordance with DHS guidelines, must be based on National Incident Management System (NIMS) procedures. It must also include provisions for both training and exercises. For these reasons, it is recommended that the governance group be integrated with the existing emergency management organizational structure. In most cases, this makes the county the most appropriate governmental entity within which to organize communications interoperability. Sustainability is critical to the success of any interoperability planning initiatives. Sustainability is best ensured when interoperability governance is developed as part an existing emergency management structure.

The TICP should become part of established local emergency management procedures. Personnel to staff communications positions within the organizational structure of the ICS should be addressed in the TICP. This will include identifying and training emergency responders to serve as COMLs within the Logistics Section of the ICS organization.

The SEMI UASI TICP has been updated. County level TICPs can be developed by extracting relevant information from the regional TICP for an individual county and adding any necessary governance and SOPs provisions.

### 6.1.2 Strategic Planning

The tactical planning process will feed into the strategic planning process by identifying gaps in interoperable communications. Training and exercises will reveal needs for improved technology, policies and procedures, and additional training. Based on these identified needs, strategic plans can be developed for acquiring resources as well as developing additional SOPs, training and exercises. Strategic planning may include requests for regional and state funding. As gaps are addressed through strategic planning, and training and exercises are held pursuant to the TICP, day-to-day usage of the interoperable resources among emergency responders will increase. TICPs are then refined as part of the on-going process of improving interoperable communications under the direction of the local governance group.

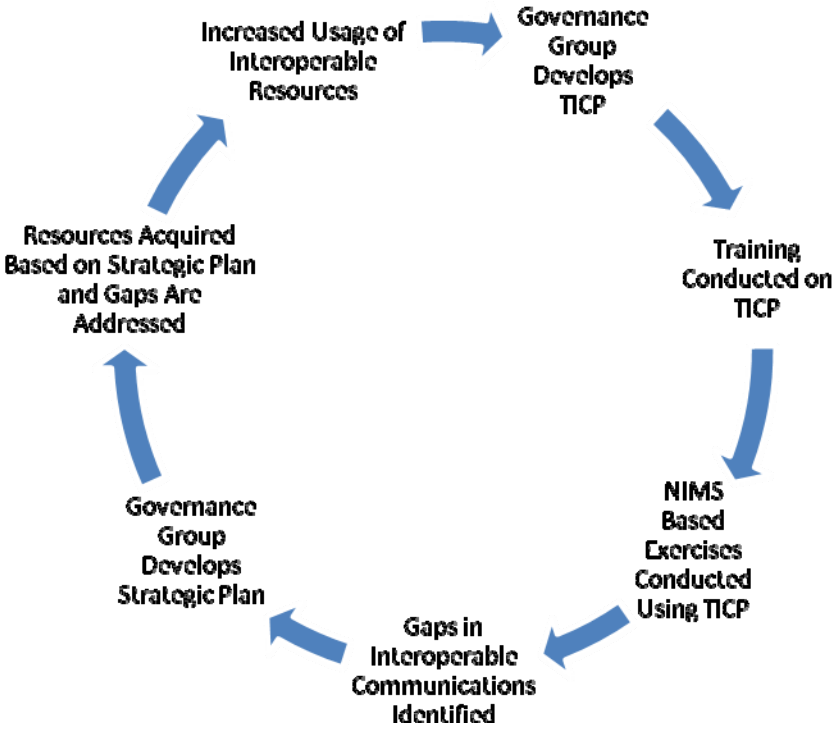


Figure 4 – Interoperability Strategic Planning Cycle

#### *6.1.2.1 Interoperability Coordination*

The local interoperability governance group must coordinate all planning activities with adjacent jurisdictions, as well as with regional and state-level governance organizations. Local SOPs must be consistent with and based on established statewide and regional interoperability policies and procedures.

## 6.2 Standard Operating Procedures

SOPs—formal written guidelines or instructions for incident response—typically have both operational and technical components. Established SOPs enable emergency responders to successfully coordinate an incident response across disciplines and jurisdictions. Clear and effective SOPs are essential in the development and deployment of any interoperable communications solution.

SOPs must be developed within the interoperability governance structure. To be effective, they must be adopted by individual agencies. All emergency responders and dispatch personnel subject to the procedures must be trained in the procedures.

The following are general SOPs that apply to the use of all interoperable communications resources.

- NIMS – Depending on the size of the incident, the use of an ICS compliant with NIMS is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or back-up specify the reason for the request.
- Unit Identification – Units should announce their home agency prior to announcing their unit identifier during interoperable communications situations when utilizing shared channel(s).
- Encryption – All encrypted radio users must operate in a "clear" mode when a shared channel is used, unless otherwise arranged in advance. If all potential users have access to the encrypted channel(s), then the use of encryption may be appropriate.
- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander or his/her designee, should ensure that the shared channel(s) is/are monitored while in use. In a smaller mutual aid response, the agency lead may also require that the shared channel(s) be monitored.

These SOPs have been incorporated into the SEMI UASI TICP.

DHS has developed a series of documents to assist governing bodies and agencies in the development of SOPs for the use of various interoperable resources. These can be found at the following Website:

http://www.safecomprogram.gov/SAFECOM/oecguidancedocuments/templatesuite.htm

SOP templates for shared systems, shared channels, system-to-system console patches, mobile gateway patches, and radio caches have been included in Appendix D–Department of Homeland Security Standard Operating Procedure Templates for Interoperable Resources. These can be used by individual agencies to implement agency SOPs. MPSCS user agencies are reminded that audio gateways (system-to-system console patches and mobile gateway patches) are subject to the MPSCS *Audio Patch/Gateway Interoperability* policy (See Appendix B –Michigan Public Safety Communications System Audio Patch and Gateway Interoperability Policy).

It was reported that most agencies in the UASI have already discontinued using radio codes for day-to-day communications. This is recommended for all agencies. This will help ensure that plain language communications are used for multi-agency, multi-jurisdiction incidents. The state of Virginia was able to institute a state-wide program to move eliminate the use of radio codes in the state except for a very limited number of law enforcement situations. For more information about the Virginia program, see:

http://www.interoperability.virginia.gov/pdfs/Common%20Language%20One%20Pager.pdf

## 6.3 Technology

### 6.3.1 Shared Systems

The optimal radio communications technology to support interoperability is the use of shared systems, such as the MPSCS, OakWIN, Warren's P25 system, the Downriver Mutual Aid trunked system, the Conference of Eastern Wayne trunked system and the Western Wayne Mutual Aid trunked system.

Because nearly the entire region is served by the aforementioned trunked radio systems, and public safety agencies are increasingly moving toward two shared systems—MPSCS and OakWIN—the technological foundation exists for employing shared systems as an interoperability solution throughout the region.

The optimal technology to support interoperable communications based on the DHS criteria is a standards-based system, i.e., a P25 compliant digital system. The only P25 systems in the UASI currently are MPSCS and the city of Warren's trunked radio system.

#### *6.3.1.1 Wayne County MPSCS*

The most effective shared system arrangement to support emergency responders in Wayne County would be to develop a Wayne County simulcast sub-system on MPSCS to support all agencies in the county outside the city of Detroit and the Grosse Pointe area. This recommendation is based on the optimal technological solution to provide interoperability. It is understood that there are political and fiscal considerations that will enter into any effort to develop such a Wayne County MPSCS sub-system.

Currently, Wayne County is constructing a two-site simulcast cell to support county agencies and local agencies in the western part of the county. As indicated earlier, Livonia is constructing a single-site MPSCS sub-system to provide service to its city agencies and will use the Wayne County prime site to support the Livonia sub-system. Other communities in western Wayne County have contracted directly with MPSCS to use the state's infrastructure on the system. The Redford Police Department is already on MPSCS and the fire department plans to move onto the system. Northfield and Northville Township public safety agencies are on MPSCS. Plymouth and Plymouth Township, except for the Plymouth Community Fire Department, are on MPSCS. Canton Township is considering transitioning to the MPSCS, but has no 800 MHz frequencies to contribute to system construction.

If a Wayne County MPSCS simulcast sub-system is to become a reality, it will require the Western Wayne Mutual Aid and Downriver Mutual Aid systems to abandon their existing aging systems. They will have to contribute infrastructure (tower sites) and frequencies to the MPSCS to construct the sub-system. Absent a source of funding to build out MPSCS infrastructure, the communities that make up these consortiums may have to contribute financially to construct the system. L.R. Kimball recognizes that these may be complex issues for the County and these municipalities. Nevertheless, if public safety agencies desire to have public safety radio systems that provide the most effective level of interoperability both to support day-to-day operational needs and major emergencies, this is the recommended technology. Further, the Metropolitan Airport's P25 trunked radio system should also be merged into the MPSCS sub-system. This will ensure interoperability with airport emergency responders and provide needed channel resources to construct the Wayne County MPSCS sub-system.

In eastern Wayne County, it is equally desirable that the Conference of Eastern Wayne upgrade its aging system and move onto MPSCS for optimal interoperability with neighboring communities in Macomb County and the city of Detroit. This can be accomplished by constructing an MPSCS single site using the existing Grosse Pointe Farms tower and existing frequencies. It may be possible to provide adequate coverage to the six Grosse Pointe communities from existing towers in the city of Detroit and Macomb County. Another possible design option might be to add the existing Grosse Pointe Farms tower to the city of Detroit simulcast cell. Whatever the most cost effective design to provide MPSCS coverage to these communities, it is strongly recommended that this system be merged into the MPSCS.

#### 6.3.1.2 MPSCS Build Out in Wayne County

L.R. Kimball's major recommendation for improving interoperable technology in the UASI is the systematic build out of the MPSCS in Wayne County to provide a single shared P25 standards-based system for all public safety users in the county. Motorola previously prepared a phased interoperability program (see Appendix F–Wayne County Radio Plan). This program called for the following phases:

- Phase I – Establish basic level of emergency interoperability among 31 local agencies by upgrading 1,444 of 3,000 existing MPSCS-upgradeable public safety radios to P25. At remaining agencies, provide each with 12 MPSCS "seed" radios for emergency usage.
- Phase II – Establish complete interoperability with 31 local agencies by upgrading remaining 1,556 existing MPSCS-upgradeable public safety radios to P25.
- Phase III – Establish seamless interoperability in areas with existing MPSCS-upgradeable 800 MHz infrastructures (seven sites) by integrating into MPSCS.
- Phase IV – Build out MPSCS infrastructure in remaining communities (estimate 13 sites) for uniform communications countywide. Assuming capacity exists to add non-public safety users to these systems and there exists a willingness to add such agencies to these systems, the most likely candidate agencies to participate as system users are governmental public works agencies, public transportation and school transportation systems.

Phases I and II have been completed. Phase III is underway with the construction of the two Wayne County sites and the Livonia MPSCS site. Motorola did not provide cost estimates for Phase III and Phase IV infrastructure construction. As indicated earlier, there are many unknowns with respect to the existing radio systems in Wayne County migrating to MPSCS. L.R. Kimball is unable to accurately estimate constructions costs given these variables. L.R. Kimball does recommend that the SEMI UASI prioritize funding to support the build out of the MPSCS to maximize interoperability. This will complete the construction of a shared standards-based radio system in five of the six UASI counties.

#### 6.3.1.3 RF ISSI

A significant interoperability feature of the P25 suite of requirements is the RF ISSI requirement. ISSI permits P25 compliant systems from any manufacturer to be interconnected. ISSI is a wireline interface that is part of the Association of Public-Safety Communications Officials (APCO) P25 Standards. Regardless of frequency or manufacturer, two different P25 land mobile radio (LMR) networks that support ISSI will have the ability to communicate with one another. In the event that the two different networks functioned in the same frequency band, users from one system would have the capability of roaming on to the other system and achieve not only

interoperability, but extended operability with their home network through the ISSI gateway. The following features should be available with any P25 compliant ISSI:
:

- Registration/De-registration
- Group Registration
- Caller ID
- Group Calls
- Encrypted Calls
- Emergency

MPSCS is currently exploring the implementation of ISSI. No policies have been developed yet by MPSCS for the use of ISSI to interconnect with other P25 systems. Currently, Motorola's ISSI solution requires their ASTRO P25 systems to be using software release 6.9/7.2 or higher.

It is recommended that if MPSCS permits ISSI with other P25 compliant systems in the future that all P25 systems in the UASI should be interconnected using ISSI. Specifically, it is recommended that the city of Warren P25 system and MPSCS be interconnected using ISSI when this technology is deployed by MPSCS. However, ISSI should NOT be used in preference to agencies sharing a single system to achieve optimal interoperability. ISSI requires both hardware and software to be added to each interconnected system at an estimated cost of $150,000 per system. The more problematic issue associated with ISSI is the on-going network management of the interfaces. All radios and interoperable talkgroups must be provisioned for use on both systems. ISSI will require additional system management on all interconnected systems to ensure that all authorized subscribers have multi-system access.

#### 6.3.1.4 OakWIN Subscriber Access to MPSCS

As discussed above, OakWIN subscriber radios are P25 capable. P25 software can be added to each radio at a cost of approximately $500 per radio. MPSCS Level 1 access can be programmed into the radios at no charge. Recognizing that these subscriber software upgrades may be cost prohibitive, L.R. Kimball recommends that only selected OakWIN public safety radios have the P25 software and MPSCS Level 1 access added. Such radios might include command level radios and any units that are likely to be called upon to respond to other areas in the state of Michigan.

#### 6.3.1.5 Regional Access to MPSCS Talkgroups

The wide-area interoperability provided by the MPSCS fleet map structure is based on conserving limited channel resources by use of Event channels that are only activated at sites in the system when needed. Some counties have created their own "event" talkgroups on the MPSCS to avoid having to go through the NCC to activate system Event talkgroups for interoperable event communications within the county.

Statewide area coverage is provided on a very limited number of talkgroups. Generally, unless Event channels are activated, interoperability on talkgroups between counties in the UASI must be provided by programming one or more talkgroups from the neighboring county into subscriber radios and/or consoles. The result is a situation that is similar to agencies having access to shared conventional channels. Although agencies did not report this as being an operational problem, it would appear to require significant programming of additional channels to ensure interoperability with MPSCS user agencies in surrounding counties. It also results in limitations when agencies must

respond to counties for which they have no local talkgroups programmed into subscriber equipment. In these cases, statewide event channels must be used. For example, if Washtenaw County assets were deployed to Macomb County, they would not have Macomb County talkgroups and statewide Event channels would have to be activated at Macomb County sites to support the Washtenaw County responders. In such circumstances, incident operations would have to be moved to an Event talkgroup or a console patch might be initiated between the Event talkgroup and local operational talkgroup.

One alternative that might be explored is to have a limited number of region-wide interoperable talkgroups for mutual aid responses. These regional channels would be active in all regional MPSCS sub-systems. There are, however, also disadvantages associated with creating region-wide talkgroups. When utilized, they would load all MPSCS sites in the region where subscribers were affiliated on the regional talkgroup. This might be a particular problem at multi-cast state MPSCS sites where capacity is limited.

Another alternative is to program a talkgroup for each specific county into subscriber radios throughout the region. For example, all police subscriber radios in the region might be programmed with a specific Macomb County police countywide talkgroup, a specific Detroit city-wide talkgroup, etc. While this would ensure that radios could operate in any county in the region, console patching or talkgroup merging might still be necessary to get responders on the correct operational talkgroup that is being used at an incident.

This situation points out the limitations of large wide-area shared systems due to the need to effectively manage channel resources. Any incident response requiring MPSCS users to respond to neighboring counties will likely require activation of event channels and either moving incident operations to the designated Event channel or interconnecting the operations talkgroup with the Event channel. This also illustrates the importance of having dispatch personnel trained in interoperability procedures to establish common talkgroups for responding agencies. Dispatch personnel have to know when Event channels are needed and how to request activation from the NCC. These are also the skills, knowledge and abilities that COMLs can bring to incident management.

Although wide-area shared systems are the optimal technology to support interoperability, they are also complex and require effective system and operational management to provide the right tools to emergency responders.

### 6.3.2 Shared Channels

There are a number of shared channels in each frequency band that can be used by public safety for interoperability. These fall into several different categories:

- National Mutual Aid Channels
- Statewide Common Channels
- HERN and UHF MED COM Channels
- MABAS Channels

### 6.3.2.1 National Mutual Aid Channels

#### 6.3.2.1.1 800 MHZ National Mutual Aid Channels

The most commonly used shared channels currently used in the UASI are the national mutual aid 800 MHz frequencies, which are programmed into all 800 MHz radios in the UASI. These analog radio channels, also known as the NPSPAC mutual aid frequencies, were established to provide a means of interoperability among 800 MHz band users. The channels use standard names throughout the nation so any 800 MHz users with these channels will have the same channel names in their radios when responding to calls for assistance outside of their normal area of operation. The national Continuous Tone-Coded Squelch System (CTCSS) tone is 156.7 Hz.

Public safety agencies holding any valid FCC license may program these frequencies into subscriber radios. Use of these frequencies in control stations, repeaters and base stations requires individual FCC licensing.

The 800 MHz NPSPAC frequencies are being rebanded and will be moving 15 MHz lower in the spectrum. Rebanding in Michigan has been delayed pending negotiations with Canada. These channels are currently named as ICALL and ITAC channels. Post-rebanding they will use the new APCO/National Public Safety Telecommunications Council (NPSTC) standardized interoperability channel names of 8CALL90 and 8TAC91-94. Below are the frequency tables for these channels. OakWIN radios currently have both sets of channels programmed.

Table 1 – Pre-rebanding 800 MHz National Mutual Aid Channels

| 800 MHz National Mutual Aid Channels Pre-rebanding | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz) | Mobile TX (MHz) |
| Calling–Repeater | ICALL | 866.0125 | 821.0125 |
| Calling–Direct | ICALLD | 866.0125 | 866.0125 |
| Tactical–Repeater | I8TAC1 | 8661.5125 | 821.5125 |
| Tactical–Direct | I8TAC1D | 866.5125 | 866.5125 |
| Tactical–Repeater | I8TAC2 | 867.0125 | 822.0125 |
| Tactical–Direct | I8TAC2D | 867.0125 | 822.0125 |
| Tactical–Repeater | I8TAC3 | 867.5125 | 822.5125 |
| Tactical–Direct | I8TAC3D | 867.5125 | 867.5125 |
| Tactical–Repeater | I8TAC4 | 868.0125 | 823.0125 |
| Tactical–Direct | I8TACD | 868.0125 | 868.0125 |
| NOTE: Default operation should be CSQ receive, CTCSS 156.7(5A) transmit. If the user can enable/disable CTCSS without re-programming the radio, the indicated CTCSS tone should also be programmed for receive and the user instructed how and when to enable/disable. | | | |

Table 2 – Post-rebanding 800 MHz National Mutual Aid Channels

| 800 MHz National Mutual Aid Channels Post-rebanding | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz) | Mobile TX (MHz) |
| Calling–Repeater | 8CALL90 | 851.0125 | 806.0125 |
| Calling–Direct | 8CALL90D | 851.0125 | 851.0125 |
| Tactical–Repeater | 8TAC91 | 851.5125 | 806.5125 |
| Tactical–Direct | 8TAC91D | 851.5125 | 851.5125 |
| Tactical–Repeater | 8TAC92 | 852.0125 | 807.0125 |
| Tactical–Direct | 8TAC92D | 852.0125 | 852.0125 |
| Tactical–Repeater | 8TAC93 | 852.5125 | 807.5125 |
| Tactical–Direct | 8TAC93D | 852.5125 | 852.5125 |
| Tactical–Repeater | 8TAC94 | 853.0125 | 808.0125 |
| Tactical–Direct | 8TAC94D | 853.0125 | 853.0125 |
| NOTE: 8CALL and 8TAC were previously named ICALL and ITAC channels. Default operation should be CSQ receive, CTCSS 156.7(5A) transmit. If the user can enable/disable CTCSS without re-programming the radio, the indicated CTCSS tone should also be programmed for receive and the user instructed how and when to enable/disable. | | | |

These channels should continue to be programmed into all 700/800 MHz subscriber radios in the UASI.

#### *6.3.2.1.2 700 MHZ National Mutual Aid Channels*

The FCC has created a set of conventional national mutual aid channels in the 700 MHz public safety spectrum. These channels are to be programmed using P25 digital modulation, except that mobile and portables may use analog modulation as a secondary mode. There are also 16 low power (not to exceed two watts) 700 MHz channels that may be used in mobiles and portables for on-scene coordination. At this time, no required programming of interoperable mutual aid channels has been established by the Region 21 (Michigan) 700 MHz Planning Committee.

These channels must be licensed for use by the FCC through the Region 21 700 MHz Planning Committee. A licensee need not be operating on a 700 MHz trunked radio system to license these channel for interoperability use. The licensee need only have 700 MHz capable radios.

OakWIN radios are currently programmed with a sub-set of the listed 700 MHz interoperability channels and a number of low power on-scene incident response channels used by Illinois and Michigan MABAS. They are currently programmed as analog channels.

L.R. Kimball recommends that the SEMI UASI ICC work with the Region 21 700 MHz Planning Committee to establish a prioritized list of these channels to be used in the UASI, along with the recommended modulation to be used.

Table 3 – 700 MHz Conventional P25 Digital National Mutual Aid Channels

| 700 MHz Interoperability Channels (12.5 kHz Channels) | | | |
|---|---|---|---|
| FCC Channel (Subscriber Load) | | Primary Use | NPSTC ID |
| Receive Channel | Transmit Channel | | |
| 769.14375 | 799.14375 | General Public Safety | 7TAC51 |
| | 769.14375 | | 7TAC51D* |
| 769.24375 | 799.24375 | Calling Channel | 7CALL50 |
| | 769.24375 | | 7CALL50D |
| 769.39375 | 799.39375 | EMS | 7MED65 |
| | 769.39375 | | 7MED65D |
| 769.49375 | 799.49375 | EMS | 7MED66 |
| | 769.49375 | | 7MED66D |
| 769.64375 | 799.64375 | General Public Safety | 7TAC52 |
| | 769.64375 | | 7TAC52D |
| 769.74375 | 799.74375 | General Public Safety | 7TAC55 |
| | 769.74375 | | 7TAC55D |
| 769.89375 | 799.89375 | Fire | 7FIRE63 |
| | 769.89375 | | 7FIRE63D |
| 769.99375 | 799.99375 | Fire | 7FIRE64 |
| | 769.99375 | | 7FIRE64D |
| 770.14375 | 800.14375 | General Public Safety | 7TAC53 |
| | 770.14375 | | 7TAC53D |
| 770.24375 | 800.24375 | General Public Safety | 7TAC56 |
| | 770.24375 | | 7TAC56D |
| 770.39375 | 800.39375 | Law Enforcement | 7LAW61 |
| | 770.39375 | | 7LAW61D |
| 770.49375 | 800.49375 | Law Enforcement | 7LAW62 |
| | 770.49375 | | 7LAW62D |
| 770.64375 | 800.64375 | General Public Safety | 7TAC54 |
| | 770.64375 | | 7TAC54D |
| 770.74375 | 800.74375 | Mobile Data | 7DATA69 |
| | 770.74375 | | 7DATA69D |
| 770.89375 | 800.89375 | Mobile Repeater | 7MOB59 |
| | 770.89375 | | 7MOB59D |

| 700 MHz Interoperability Channels (12.5 kHz Channels) | | | |
|---|---|---|---|
| FCC Channel (Subscriber Load) | | Primary Use | NPSTC ID |
| Receive Channel | Transmit Channel | | |
| 770.99375 | 800.99375 | Other Public Service | 7GTAC57 |
| | 770.99375 | | 7GTAC57D |
| 773.00625 | 803.00625 | EMS | 7MED86 |
| | 773.00625 | | 7MED86D |
| 773.10625 | 803.10625 | General Public Safety | 7TAC71 |
| | 773.10625 | | 7TAC71D |
| 773.25625 | 803.25625 | Calling Channel | 7CALL70 |
| | 773.25625 | | 7CALL70D |
| 773.35625 | 803.35625 | EMS | 7MED87 |
| | 773.35625 | | 7MED87D |
| 773.50625 | 803.50625 | Fire | 7FIRE83 |
| | 773.50625 | | 7FIRE83D |
| 773.60625 | 803.60625 | General Public Safety | 7TAC72 |
| | 773.60625 | | 7TAC72D |
| 773.75625 | 803.75625 | General Public Safety | 7TAC75 |
| | 773.75625 | | 7TAC75D |
| 773.85625 | 803.85625 | Fire | 7FIRE84 |
| | 773.85625 | | 7FIRE84D |
| 774.00625 | 804.00625 | Law Enforcement | 7LAW81 |
| | 774.00625 | | 7LAW81D |
| 774.10625 | 804.10625 | General Public Safety | 7TAC73 |
| | 774.10625 | | 7TAC73D |
| 774.25625 | 804.25625 | General Public Safety | 7TAC76 |
| | 774.25625 | | 7TAC76D |
| 774.35625 | 804.35625 | Law Enforcement | 7LAW82 |
| | 774.35625 | | 7LAW82D |
| 774.50625 | 804.50625 | Mobile Repeater | 7MOB79 |
| | 774.50625 | | 7MOB79D |
| 774.60625 | 804.60625 | General Public Safety | 7TAC74 |
| | 774.60625 | | 7TAC74D |
| 774.75625 | 804.75625 | Mobile Data | 7DATA89 |
| | 774.75625 | | 7DATA89D |
| 774.85625 | 804.85625 | Other Public Service | 7GTAC77 |
| | 774.85625 | | 7GTAC77D |
| *"D" in the Channel ID indicates "direct" or "talkaround" mode. | | | |

| 700 MHz Interoperability Channels (12.5 kHz Channels) | | | |
|---|---|---|---|
| FCC Channel (Subscriber Load) | | Primary Use | NPSTC ID |
| Receive Channel | Transmit Channel | | |
| These channels use the default NAC of $293.<br>Ref: http://www.apco911.org/frequency/documents/700_NB_channel_centers.pdf | | | |

### 6.3.2.1.3 VHF High Band National Mutual Aid Channels

The table below identifies the VHF national mutual aid channel, including the standardized channel names and CTCSS tones. All, or nearly all, VHF High Band radios in the UASI will have to be reprogrammed for narrowband operation prior to January 1, 2013. This offers the opportunity to add these channels to all radios. Where channel capacity of a radio does not permit programming all five channels, L.R. Kimball recommends that VCALL10 and as many VTAC channels be programmed as possible.

Table 4 – VHF High Band Mutual Aid Channels

| VHF Low Band Interoperability Channels | | | | |
|---|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz) | Mobile TX (MHz) | CTCSS Tone* |
| Calling | VCALL10 | 155.7525 | 155.7525 | CSQ /156.7 |
| Tactical | VTAC11 | 151.1375 | 151.1375 | CSQ /156.7 |
| Tactical | VTAC12 | 154.4525 | 154.4525 | CSQ /156.7 |
| Tactical | VTAC13 | 158.7375 | 158.7375 | CSQ /156.7 |
| Tactical | VTAC14 | 159.4725 | 159.4725 | CSQ /156.7 |
| Tac Rpt | VTAC33** | 159.4725 | 151.1375 | CSQ / 136.5 |
| Tac Rpt | VTAC34** | 158.7375 | 154.4525 | CSQ / 136.5 |
| Tac Rpt | VTAC35** | 159.4725 | 158.7375 | CSQ / 136.5 |
| Tac Rpt | VTAC36** | 151.1375 | 159.4725 | CSQ / 136.5 |
| Tac Rpt | VTAC37** | 154.4525 | 158.7375 | CSQ / 136.5 |
| Tac Rpt | VTAC38** | 158.7375 | 159.4725 | CSQ / 136.5 |
| *Default operation should be CSQ receive, CTCSS transmit (156.7 MHz, 5A). If the user can enable/disable without re-programming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.<br>**VTAC33-38 recommended for deployable tactical repeater use only (FCC Station Class FB2T). VTAC36-38 are preferred; VTAC33-35 should be used on when necessary due to interference. | | | | |

Public safety agencies holding any valid FCC license may program the VCALL and VTAC frequencies into mobile and portable radios. Use of these frequencies in control stations, repeaters and base stations requires individual FCC licensing.

These channels should be programmed into all VHF subscriber radios in the UASI and in all VHF radios in MCUs or mobile command posts and any mobile radios attached to interoperable gateways providing interoperability.

#### 6.3.2.1.4 UHF National Mutual Aid Channels

UHF channels are used in several counties in the region. The table below identifies the UHF national mutual aid channel, including the standardized channel names and CTCSS tones. All, or nearly all, UHF radios in the UASI will have to be reprogrammed for narrowband operation prior to January 1, 2013. This offers the opportunity to add these channels to all radios.

Public safety agencies holding any valid FCC license may program the UCALL and UTAC frequencies into mobile and portable radios. Use of these frequencies in control stations, repeaters and base stations requires individual FCC licensing.

These channels should be programmed into all UHF subscriber radios in the UASI and in all UHF radios in MCUs or mobile command posts and any mobile radios attached to interoperable gateways providing interoperability.

Table 5 – National UHF Mutual Aid Channels

| National UHF Mutual Aid Channels | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz)* | Mobile TX (MHz)* |
| Calling – Repeater | UCALL40 | 453.2125 | 458.2125 |
| Calling – Direct | UCALL40D | 453.2125 | 453.2125 |
| Tactical – Repeater | UTAC41 | 453.4625 | 458.4625 |
| Tactical – Direct | UTAC41D | 453.4625 | 453.4625 |
| Tactical – Repeater | UTAC42 | 453.7125 | 458.7125 |
| Tactical – Direct | UTAC42D | 453.7125 | 453.7125 |
| Tactical – Repeater | UTAC43 | 453.8625 | 458.8625 |
| Tactical – Direct | UTAC43D | 453.8625 | 453.8625 |
| *Default operation should be CSQ receive, CTCSS 156.7(5A) transmit. If the user can enable/disable CTCSS without re-programming the radio, the indicated CTCSS tone should also be programmed for receive and the user instructed how and when to enable/disable. | | | |

### 6.3.2.2 Statewide Common Channels

There are a number of statewide "common" channels that can be used for interoperability. These include the Michigan Emergency Public Safety System (MEPSS), a police mutual aid channel that uses the simplex analog frequency of 155.865 MHz.

In Michigan, radio frequency 154.295 MHz has been designated exclusively as an interagency fire coordinating system known as the State Fire Emergency Radio Frequency. It is also referred to as the DNR fire ground frequency.

It is recommended that these channels be programmed by discipline into police and fire subscriber radios in the UASI if channel capacity permits. At a minimum, these channels should be programmed into all mobile radios in MCUs and VHF radios used with gateway devices for interoperability.

*The remainder of this page intentionally left blank.*

### 6.3.2.3 HERN and UHF MEDCOMM Channels

All ambulances in Michigan are required by the Michigan Department of Community Health to have VHF channels designated as HERN channels in their radios for ambulance-to-hospital coordination and on-scene medical coordination.

Table 6 – HERN VHF Channels

| Michigan Hospital Emergency Radio Network | | |
|---|---|---|
| Channel Name | Primary Use | CTCSS Tones |
| HERN 155.340 | Reserved for communications between hospitals (and other facilities equipped for receiving emergency patients) and EMS personnel for the purpose of coordination and instruction regarding care and transport of patients in the rendition or delivery of emergency medical services. Dispatch and paging operations are not allowed on this frequency. (Commonly known as the HEAR or HERN channel) | CSQ |
| HERN 155.400 | St. Clair, Macomb, Oakland, Wayne, Monroe, Washtenaw and Livingston; this frequency is reserved for disaster coordination purposes and as a secondary HEAR/HERN channel. | CSQ |
| HERN 155.355 | Mobile and portable only; on–scene coordination of EMS resources; mutual aid; tactical operations. | CSQ |

National UHF MED channels are also used in the UASI and throughout Michigan.

The HERN channels and the UHF MED are not channels created for interoperability purposes. They are operational channels used for medical coordination. However, because they are common channels and are used for on-scene multi-agency incident coordination, they should be programmed into all VHF and UHF radios used in all mobile radios in MCUs and VHF radios used with gateway devices for interoperability.

The table below identifies the UHF channels used by EMS in Michigan.

Table 7 – UHF Wideband MED Channels

| UHF MED Channels-Wideband | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz)<br>Mobile TX (MHz) | CTCSS Tone* |
| EMS Common | MED-1W [1]<br>MED-1 | 463.000 | CSQ – See note below |
| | | 468.000 | 156.7 |
| EMS Common | MED-2W | 463.025 | CSQ – See note below |

| UHF MED Channels-Wideband | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz)<br>Mobile TX (MHz) | CTCSS Tone* |
| | MED-2 | 468.025 | 156.7 |
| EMS Common | MED-3W<br>MED-3 | 463.050 | CSQ – See note below |
| | | 468.050 | 156.7 |
| EMS Common | MED-4W<br>MED-4 | 463.075 | CSQ – See note below |
| | | 468.075 | 156.7 |
| EMS Common | MED-5W<br>MED-5 | 463.100 | CSQ – See note below |
| | | 468.100 | 156.7 |
| EMS Common | MED-6W<br>MED-6 | 463.125 | CSQ – See note below |
| | | 468.125 | 156.7 |
| EMS Common | MED-7W<br>MED-7 | 463.150 | CSQ – See note below |
| | | 468.150 | 156.7 |
| EMS Common | MED-8W<br>MED-8 | 463.175 | CSQ – See note below |
| | | 468.175 | 156.7 |
| EMS Common Dispatch | MED-9W<br>MED-9 | 462.950 | CSQ – See note below |
| | | 467.950 | 156.7 |
| EMS Common Dispatch | MED-10W<br>MED-10 | 462.975 | CSQ – See note below |
| | | 467.975 | 156.7 |

[1] The "W" in the Channel ID indicates the channel is a wideband channel.

These frequencies are currently used primarily as wideband (25 kHz) channels. Prior to January 1, 2013, these channels must be narrowbanded.

* Default operation should be CSQ receive, CTCSS 156.7 Hz (5A) transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.

*The remainder of this page intentionally left blank.*

The table below identifies the UHF channels available for use by EMS in Michigan in narrowband-capable radios. There was no indication that they are currently being used by in the UASI. Nevertheless, it is recommended that if there is sufficient channel capacity the frequencies be programmed in all mobile radios in MCUs and VHF radios used with gateway devices for interoperability.

Table 8 – UHF Narrowband MED Channels

| UHF MED Channels-Narrowband | | | |
|---|---|---|---|
| Description | Channel ID | Mobile RX (MHz)<br>Mobile TX (MHz) | CTCSS Tone* |
| EMS Common | MED-12 | 463.0125 | CSQ – See note below |
| | | 468.0125 | 156.7 |
| EMS Common | MED-22 | 463.0375 | CSQ – See note below |
| | | 468.0375 | 156.7 |
| EMS Common | MED-32 | 463.0625 | CSQ – See note below |
| | | 468.0625 | 156.7 |
| EMS Common | MED-42 | 463.0875 | CSQ – See note below |
| | | 468.0875 | 156.7 |
| EMS Common | MED-52 | 463.1125 | CSQ – See note below |
| | | 468.1125 | 156.7 |
| EMS Common | MED-62 | 463.1375 | CSQ – See note below |
| | | 468.1375 | 156.7 |
| EMS Common | MED-72 | 463.1625 | CSQ – See note below |
| | | 468.1625 | 156.7 |
| EMS Common | MED-82 | 463.1875 | CSQ – See note below |
| | | 468.1875 | 156.7 |
| EMS Common Dispatch | MED-92 | 462.9625 | CSQ – See note below |
| | | 467.9625 | 156.7 |
| EMS Common Dispatch | MED-102 | 462.9875 | CSQ – See note below |
| | | 467.9875 | 156.7 |

* Default operation should be CSQ receive, CTCSS 156.7 Hz (5A) transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.

### 6.3.2.4 MABAS Shared Channels

MABAS is a fire mutual aid system that started in Illinois. It now has participants in Wisconsin, Michigan, Indiana, Iowa and Missouri. Participating fire departments agree to provide equipment and personnel to each other on request. The Oakland County MABAS CST is associated with and supported by Michigan MABAS. The Michigan MABAS has licensed a set of VHF frequencies for use by participating agencies. Some of these frequencies are the VHF national mutual aid frequencies, some are nationally recognized fire mutual aid frequencies, and others are MABAS-specific frequencies. All participating MABAS fire departments have VHF radios for MABAS mutual aid responses. Nearly every fire department in Oakland County participates in MABAS, along with an increasing number of fire departments in other UASI counties. For this reason, it is recommended that all VHF radios installed in MCUs and/or attached to interoperable gateways to support incident communications be programmed with the MABAS channels using the MABAS channel names.

Table 9 – Michigan MABAS Radio Channels

| Michigan MABAS Frequencies | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Name | Analog / Digital | Wideband / Narrowband | Tx Freq | Tx Tone | Rx Freq | Rx Tone | Primary Use |
| FG–BLACK | Analog | Narrowband | 154.2725 | 94.8 / ZA | 154.2725 | 94.8 / ZA | Fire ground mutual aid |
| FG–BLUE | Analog | Wideband | 154.2950 | 85.4 / YA | 154.2950 | CSQ | Fire ground mutual aid |
| FG-GOLD | Analog | Narrowband | 153.8375 | 91.5 / ZZ | 153.8375 | 91.5 / ZZ | Fire ground mutual aid |
| FG–GRAY | Analog | Narrowband | 154.2875 | 136.5 / 4Z | 154.2875 | 136.5 / 4Z | Fire ground mutual aid |
| FG–RED | Analog | Wideband | 153.8300 | 156.7 / 5A | 153.8300 | CSQ | Fire ground mutual aid |
| FG–WHITE | Analog | Wideband | 154.2800 | 74.4 / WA | 154.2800 | CSQ | Fire ground mutual aid |
| FG–IFERN | Analog | Wideband | 154.2650 | 210.7 / M2 | 154.2650 | CSQ | Fire ground mutual aid |
| FG–IFERN2 | Analog | Narrowband | 154.3025 | 67.0 / XZ | 154.3025 | 67.0 / XZ | Fire ground mutual aid |
| VCALL | Analog | Narrowband | 155.7525 | 156.7 / 5A | 155.7525 | 156.7 / 5A | National mutual aid calling channel |
| VFIRE21 | Analog | Wideband | 154.2800 | 156.7 / 5A | 154.2800 | 156.7 / 5A | Fire mutual aid |
| VFIRE22 | Analog | Wideband | 154.2650 | 156.7 / 5A | 154.2650 | 156.7 / 5A | Fire mutual aid channel |
| VFIRE23 | Analog | Wideband | 154.2950 | 156.7 / 5A | 154.2950 | 156.7 / 5A | Fire mutual aid |
| VFIRE24 | Analog | Narrowband | 154.2725 | 156.7 / 5A | 154.2725 | 156.7 / 5A | Fire mutual aid |

| Michigan MABAS Frequencies | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Name | Analog / Digital | Wideband / Narrowband | Tx Freq | Tx Tone | Rx Freq | Rx Tone | Primary Use |
| VFIRE25 | Analog | Narrowband | 154.2875 | 156.7 / 5A | 154.2875 | 156.7 / 5A | Fire mutual aid |
| VFIRE26 | Analog | Narrowband | 154.3025 | 156.7 / 5A | 154.3025 | 156.7 / 5A | Fire mutual aid |
| VTAC11 | Analog | Narrowband | 151.1375 | 156.7 / 5A | 151.1375 | 156.7 / 5A | National mutual aid tactical channel |
| VTAC12 | Analog | Narrowband | 154.4525 | 156.7 / 5A | 154.4525 | 156.7 / 5A | National mutual aid tactical channel |
| VTAC13 | Analog | Narrowband | 158.7375 | 156.7 / 5A | 158.7375 | 156.7 / 5A | National mutual tactical channel |
| VTAC14 | Analog | Narrowband | 159.4725 | 156.7 / 5A | 159.4725 | 156.7 / 5A | National mutual aid tactical channel |

#### *6.3.2.5 Programming National Mutual Aid Channels in UASI Subscriber Radios*

The UASI has a concerted effort to program the 800 MHz national mutual aid channels in all 800 MHz subscriber radios in the region. There has been less effort to ensure that all VHF High Band and UHF radios in the region are programmed with the respective national mutual aid channels. Prior to January 1, 2013, VHF High Band and UHF radios in the region must be reprogrammed for narrowband channel spacing. During this process, L.R. Kimball recommends that all mutual aid channels be added to these subscriber radios. If channel capacity is limited in some radios, it is recommended that the UASI prioritize these channels for programming. For UHF channels, the "direct mode" should be programmed where channel capacity is limited.

L.R. Kimball recommends that the UASI set a minimum channel capacity for subscriber equipment to be purchased by public safety agencies in the UASI to ensure that new equipment can be programmed with all national interoperability channels. Only subscriber radios with this minimum channel capacity should be approved for UASI funding.

All subscriber radios included in any radio cache established for use in the UASI should be programmed with all national mutual aid channels. Any mobile radios installed in MCUs for on-scene incident management should be so programmed.

### 6.3.3 Radio Caches

The least desirable technological solution for achieving interoperability is "swapping" radios or establishing radio caches to provide radios to emergency responders. The table below lists the existing radio caches in the UASI region. These radio caches are seldom exercised or deployed. They generally have no formal procedures for deployment. L.R. Kimball recommends that each cache owner develop formal deployment procedures based on the model SOPs included in the appendices and that these procedures are included in the SEMI UASI TICP.

Table 10 – Radio Caches Available in the SEMI UASI Region

| Radio Caches in the SEMI UASI Region | | |
|---|---|---|
| Agency Maintaining | Number/Type of Radio | Frequency Band |
| Detroit Emergency Management | 150 Motorola XTS5000 | 800 MHz |
| Detroit Water and Sewerage Department | 100 Motorola XTS2500 | 800 MHz |
| MABAS Division 3201 CST | 120 Harris 5250 | 700/800 MHz |
| MABAS Division 3201 CST | 70 Motorola HT1000 | VHF High Band |
| Macomb County Emergency Management | 16 Motorola XTS1500<br>34 Motorola XTS2500 | 800 MHz |
| HEMS/Region 2 South Healthcare Coalition | 50 Motorola XTS2500 | 800 MHz |
| Washtenaw County Sheriff's Office | 10 Motorola MTS2000 | 800 MHz |
| Wayne County Homeland Security and Emergency Management | 70 Motorola XTS5000 | 800 MHz |
| State of Michigan MPSCS | 244 Motorola Various Models | 800 MHz |

Except for 50 wideband-only VHF High Band radios in the MABAS Division 3201 CST radio cache, all cache radios in the region are programmed with national mutual aid channels.

### 6.3.4 Interoperable Gateways and Console Patches

Interoperable gateways include devices that pass audio between different radios on different systems, such as the Raytheon ACU-1000®, which is used by a number of agencies within the region; the Harris Network First®, which is used by Oakland County; or the Motorola MOTOBRIDGE™. These gateway devices can be fixed or mobile. All dispatch consoles identified in the region are also capable of patching together channels in the console to interconnect radio channels similar to gateway devices.

#### *6.3.4.1 Oakland County NetworkFirst® Gateway Operations*

The most extensive use of an interoperable gateway in the UASI is the NetworkFirst® fixed gateways used in Oakland County to interconnect OakWIN talkgroups with MPSCS and Warren talkgroups and conventional channels on the Southfield UHF system. Details of this gateway operation have been described earlier. One limitation of this gateway is the dependency upon the Livingston County 9-1-1 Central Dispatch to connect the five "patchable" OakWIN MPSCS talkgroups to MPSCS talkgroups in the Livingston County consoles. Based on discussions with MPSCS engineers, L.R. Kimball understands that Livingston County performs this function because they still have circuit-based consoles (as opposed to the newer IP-based consoles) and that the gateway design requires this type

of console for the existing interface. At such time as Livingston County replaces their consoles with IP-based consoles, the gateway will have to be re-engineered.

It was also reported that not all of the MPSCS talkgroups from surrounding counties are installed in the Livingston County consoles, thus limiting the ability to patch to all of Oakland's surrounding counties. Another limitation of the current arrangement is console capacity limitations in some dispatch centers. Specifically, it was reported that Washtenaw County's consoles could only accommodate one of the MPSCS Oakland County talkgroups and selected the permanently patched police talkgroup 63P911.

The current arrangement imposes a burden upon Livingston County and requires the intervention of a second dispatch center when a patch is required by an Oakland County agency. L.R. Kimball recommends installing an MPSCS dispatch console at the Oakland County Sheriff's Office dispatch center to enable Oakland County to initiate its own patches with the five patchable MPSCS talkgroups--63MPSC1, 63MPSC2, 63MPSC3, 63MPSC4, and 63MPSC5. Patching between MPSCS and OakWIN could then be done by Oakland County without external assistance. The MPSCS console for the Oakland County Sheriff's Office dispatch center should have all of the desired MPSCS talkgroups used in surrounding jurisdictions to ensure the ability to patch channels with maximum effectiveness.

The installation of an MPSCS console in Oakland to interconnect with the NetworkFirst® gateway will require re-engineering the existing interface between the eight MPSCS channels and the Oakland gateway. Preliminary budgetary estimates obtained from Motorola indicate that the cost of an MPSCS console, engineering and installation would be approximately $250,000.

Because the current design requires interfacing with a circuit-based console central electronics bank (CEB), it is likely that this interface will have to be re-designed as MPSCS consoles in the region are converted to IP-based consoles.

The current gateway solution to interconnect OakWIN talkgroups with MPSCS talkgroups is based having three permanently patched channels and five console patchable channels. There appears to be no technical constraint to installing control stations on either system interfaced as conventional resources to individual agency consoles. Using these control stations, a dispatcher could initiate a console patch between any channel in the control station and any radio channel in the agency's console.

As discussed above, some agencies are exploring the use of MPSCS control stations and console patches to interconnect local MPSCS dispatch channels with OakWIN talkgroups to provide OakWIN subscribers direct access to the MPSCS dispatch channel. Using this arrangement, OakWIN users can monitor and talk directly to neighboring MPSCS users. L.R. Kimball does not recommend permanent console patches unless authorized by the respective system's gateway/patch policies. While this arrangement should address many day-to-day interoperability problems caused by the disparate technologies, it is not without potential problems. The first issue is the inefficient use of system resources. All radio traffic on either dispatch channel that is interconnected in this manner is transmitted on the other system. This may be particularly problematic if a neighboring county's dispatch traffic must be routed through a limited capacity OakWIN low profile site. It would add substantial loading to both systems if extended to communities on all four sides of Oakland County. One suggested way to mitigate the potential loading problem is to assign a low priority to the talkgroup that is interconnected to the "out-of-county" talkgroup. This will reduce the likelihood of "busying out" a system resource for primary operational talkgroups by placing them above these "out-of-

county" interconnected talkgroups in a queue. However, assigning any public safety channel that might be used for emergency communications as a low priority channel is undesirable and may not be understood by the users. This arrangement also appears to be governed by the MPSCS *Audio Patch/Gateway Interoperability* policy (see Appendix C-- Audio Patch/Gateway Interoperability Policy) if applied to MPSCS users. For these reasons, L.R. Kimball recommends that all implications of this solution be understood before implementing it.

Connecting these control stations to local dispatch consoles to allow dispatchers to monitor the neighboring community's dispatch channel and patch these channels as needed appears to be a reasonable approach. This solution only meets the needs of the field users when subscriber radios are able to monitor dispatch activity in border communities.

#### 6.3.4.1.1 Improved MPSCS Coverage in Oakland County

As discussed above, MPSCS coverage in Oakland County is based on the MPSCS mobile coverage criteria. With the build out of MPSCS in counties surrounding Oakland, MPSCS coverage along the county's borders is good and supports a high-level of portable coverage. Additional coverage is most needed in the central part of the county, particularly in the Pontiac area. An additional MPSCS tower site in this area would improve coverage for MPSCS users responding to Oakland County to provide assistance. L.R. Kimball recognizes that an additional tower in Oakland County may not be a high priority for MPSCS based on its system coverage requirements and primary service requirements. However, given Oakland County's gateway solution for providing connectivity between MPSCS and OakWIN, inter-system interoperability would be enhanced by providing improved portable coverage in Oakland County.

### 6.3.4.2 Fixed Gateway Operations

In addition to the Oakland County NetworkFirst® gateway, the only other fixed gateway identified in the region is Monroe County Central Dispatch's gateway. This fixed gateway is a notable use of this technology. The center uses a Raytheon ACU-1000® to connect fixed bases and control stations on several non-public safety systems, including the Monroe Public Schools Transportation UHF system, Jefferson Schools Transportation VHF, Lenawee County Sheriff's Office VHF, a marine band radio for the U.S. Coast Guard and MPSCS talkgroups. The gateway is interfaced with the console.

While Monroe County's countywide solution may be not suitable for more populated counties, the concept of a dispatch center fixed gateway to interconnect multiple systems can be employed at the local level. Console patches can perform similar functions but require all gateway radios to have console access and the ability to control channel selection on the radios from the console. A single interoperable gateway within a county's central dispatch center might be used to support a number of non-public agencies within the county. Each individual PSAP would not need to have its own interoperable gateway. This arrangement would, however, require the central dispatch center to be responsible for configuring the gateway and operating it when needed.

Interoperable gateways should be used judiciously. The connection should be used only as long as necessary to support the incident response. Users should keep in mind that interconnecting two systems adds the loading of each channel to the other system. MPSCS users also must comply with the MPSCS's *Audio Patch/Gateway Interoperability* policy (See Appendix C –Michigan Public Safety Communications System Audio Patch and Gateway Interoperability Policy). Establishing SOPs for each gateway and console patches is desirable. Model policies and

procedures for interoperable gateways have been included in Appendix E—Department of Homeland Security Standard Operating Procedure Templates for Interoperable Resources.

In addition to Monroe County, the two SEMI UASI counties that have multiple disparate radio systems in adjacent counties are Washtenaw and St. Clair Counties. Both counties would benefit from having fixed gateways installed at their county central dispatch PSAPs. These gateways would be similar to the ACU-1000® used in Monroe County. They would have control stations for neighboring counties connected to the gateway, as well as any desired local non-public safety radio systems (e.g., marine radio for U.S. Coast Guard and local public works systems). There should also be an MPSCS connection and console connection. These fixed gateways will require individualized design and engineering to ensure proper functioning.

The cost of a fixed gateway will vary depending on the number and types of resources that are connected to it and any remote applications. A number of vendors provide IP-based gateway devices that can support this type of solution, including Motorola's MOTOBRIDGE™; Raytheon's JPS ACU-1000® or JPS ACU-2000® , which is able to interconnect Session Initiated Protocol (SIP) Voice over IP (VoIP) devices; Cisco's IPIC®; and Harris' NetworkFirst®. The cost of an ACU-2000® is approximately $12,000. The total cost of a typical PSAP gateway installation may range from $25,000 to $30,000 depending on the types of interfaces and local access to the radio resources. L.R. Kimball recommends that any fixed gateways be purchased with design and installation from a single radio vendor to ensure effective integration of the various components.

#### 6.3.4.3 Mobiles Gateways

There are numerous mobile gateways in the SEMI UASI, primarily installed in local mobile command posts. At this time, L.R. Kimball does not recommend any additional mobile gateway devices. However, L.R. Kimball recommends that any mobile gateway device installed in MCUs include connections to mobile radios on VHF High Band, UHF, and 800 MHz bands. It is also recommended that MCUs that might be deployed to Oakland County also include an 800 MHz OpenSky® radio programmed to operate on the OakWIN system. The following cost estimates are provided for budgetary purposes for a typical MCU mobile gateway operation.

Table 11 – Estimated Costs of Mobile Gateways for MCUs

| Equipment | Number | Unit Cost | Sub-total Cost |
|---|---|---|---|
| Gateway Device | 1 | $12,000 | $12,000 |
| 800 MHz Radio | 1 | $3,000 | $3,000 |
| 800 MHZ OpenSky® Radio | 1 | $3,000 | $3,000 |
| VHF High Band Radio | 1 | $3,000 | $3,000 |
| UHF Radio | 1 | $3,000 | $3,000 |
| Integration, Design Antenna System, and Installation | | | $2,000 |
| Total: | | | $26,000 |

The cost of implementing a mobile gateway solution can vary widely depending on the complexity and capacity of the gateway device, the number and cost of the mobiles radios to be interconnected and any necessary antenna

systems to support the radios. To properly install a mobile gateway device may require minimum antenna separation. Whenever possible, mobile gateways systems should be procured from and installed by one vendor as an integrated system to ensure proper engineering.

DHS's Interoperable Communications Technical Assistance Program (ICTAP) prepared an *Audio Gateway Handbook* (March 2006), which provides an overview of various gateway configurations including sample prices at the time of publication. This document can be found at:

http://www.npstc.org/documents/Audio%20Gateway%20Handbook_320_Final.pdf

This handbook can serve as a useful tool in designing gateway systems and will assist in identifying costs.

Proper training in gateway use is critical. Indiscriminate use of gateways may cause serious communications problems at incidents.

## 6.4 Incident Communications Support

One of the needs associated with any multi-jurisdictional, multi-agency, or multi-disciplinary emergency is coordination of communications. All public safety agencies are required to utilize the NIMS principles when responding to such an incident. One feature of NIMS is ICS, a standardized, on-scene, all-hazards incident management approach that:

- Allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure
- Enables a coordinated response among various jurisdictions and functional agencies, both public and private
- Establishes common processes for planning and managing resources

ICS is flexible and can be used for incidents of any type, scope, and complexity. ICS allows its users to adopt an integrated organizational structure to match the complexities and demands of single or multiple incidents.

ICS is used by all levels of government—federal, state, tribal, and local—as well as by many non-governmental organizations and the private sector. ICS is also applicable across disciplines. It is typically structured to facilitate activities in five major functional areas: Command, Operations, Planning, Logistics, and Finance/Administration. All functional areas may or may not be used based on incident needs. Intelligence/Investigations is an optional sixth functional area that is activated on a case-by-case basis.

As a system, ICS is extremely useful; not only does it provide an organizational structure for incident management, but it also guides the process for planning, building, and adapting that structure. Using ICS for every incident or planned event helps hone and maintain skills needed for large-scale incidents.

Within the ICS organizational structure communications support is part of the Logistics Section. The Communication Unit is lead by a COML. Figure 5 is a typical ICS structure illustrating the COML position under the Logistics Section.

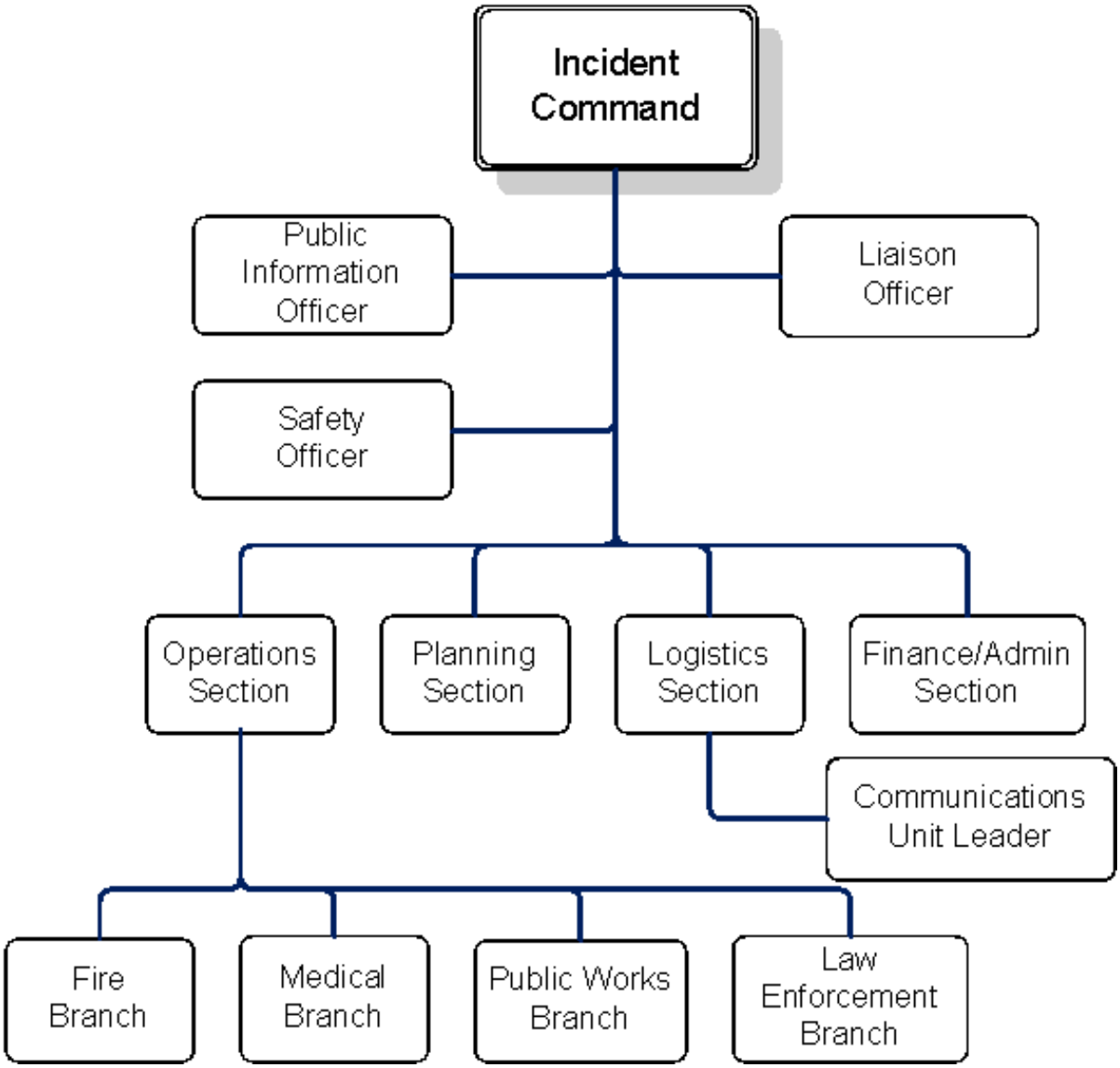


Figure 5 – Typical Multi-disciplinary ICS Organizational Structure

The support provided by the Communications Unit may include the deployment of radio resources including radio caches, MCUs, communications SOWs, mobile interoperable gateways, as well as other communications equipment.

### 6.4.1 Communications Unit Leaders

The COML plays a critical support role within the ICS. ICS establishes basic principles, practical tools, and a definitive nomenclature and structure for supporting incident-based emergency response. The COML is responsible

for integrating communications and ensuring that operations are supported by communications. The COML must understand ICS and local response systems to support the efforts of the command team.

The COML is responsible for both operational and technical aspects of communications during an incident. Operational aspects include establishing field communications between the Incident Command Post (ICP) and dispatch center(s) using incident dispatchers, tactical dispatchers, or radio operators; monitoring field communications; and monitoring effective use of radio channels/talkgroups. Technical aspects include determining the appropriate radio channels/talkgroups to be used, programming and deployment of cache radios, and interference mitigation.

The role of COML was developed in response to the need for a cadre of individuals who are knowledgeable, trained, and certified to support communications during incidents managed under ICS. A number of individuals in the UASI have completed the basic DHS COML training course, but not all have completed the field work to be "certified" as a COML by DHS.

Among the trained COMLs, some are members of the MABAS Division 3201 CST. A COML class was recently conducted for the CST. As a result, the CST now has a total of 14 trained COMLs. However, others are not a part of a structured communications incident response team. The ability to activate and deploy these individuals for incident response within the region is limited. They are listed in the TICP as regional resources that may be called.

If agencies within the UASI are to have effective Communications Units within the ICS, it is imperative that COMLs be part of an incident response structure. The MABAS Division 3201 CST provides such a structure. No other communications incident response teams or units were identified in the UASI.

There is a need for more trained and certified COMLs within the UASI. These COMLs should be trained to staff local incident response teams. L.R. Kimball recommends that every agency in the UASI that maintains an MCU or mobile command post that provides on-scene communications support incident management have at least two COMLs assigned to the unit. Whenever the MCU is deployed, a COML should be deployed with it.

### 6.4.2 Communications Support Teams

The only structured CST identified in the UASI to support major ICS operation is Oakland County's MABAS Division 3201 CST. Even the MPSCS SOW is only deployed with technical support; not COMLs or other operationally trained staff.

In Oakland County, all but one fire department are members of MABAS. As a result, they employ the structured box alarm system for calling for mutual aid and additional resources as incidents escalate. Deployment of the CST is incorporated into the box alarm deployment for major incidents. As participation in MABAS increases in other UASI counties, the systematic deployment of the CST for incidents can be employed by the participating fire services.

As indicated earlier, the region has been training COMLs, but, in some cases, they have no communications unit structures in which to assign them. As a result, they will have difficulty completing their task books to be certified and will likely lose the skills, knowledge and abilities they acquired in the COML training course.

Additional CSTs like the MABAS Division 3201 CST are desirable within the UASI. However, such support teams cannot be developed and maintained outside of an existing organizational structure. They must have an organizational home to provide equipment and operational funding. Equipping and maintaining a communications support team like the Oakland CST requires a substantial commitment of resources by an agency. In addition to the willingness of a public safety agency to equip and organizationally support such a team, participating agencies who supply personnel must be willing to devote the duty time of the personnel to training, maintenance duties, exercises, and deployments.

L.R. Kimball recommends that the UASI encourage the development of another CST in the UASI. It may be logical to have a Region 2 North (Oakland, Macomb, and St. Clair Counties) team and a Region 2 South (Washtenaw, Wayne, and Monroe Counties) team. Each team would be equipped with deployable mutual aid infrastructure and radio caches. The existing MABAS CST would provide the coverage to the Region 2 North area and a new team or possibly a second MABAS CST team could be developed to provide service to the Region 2 South area.

If a second CST can be supported in the UASI, the region may want to consider additional deployable communications infrastructure in the form of another communications SOW similar to the equipment currently maintained by the MABAS CST. The cost of a new fully equipped towable SOW with 60-foot mast and tow vehicle, mutual aid repeaters and base stations, mobile radios, mobile gateway, on-board console, and radio cache is estimated to cost in the range of $500,000 to $700,000. This SOW would provide the equipment needs for a second CST in the UASI. Providing an organizational home and personnel staffing for a second CST must be accomplished before procuring additional deployable infrastructure equipment. At this time, L.R. Kimball does not recommend investing in additional deployable infrastructure until an additional structured CST can be supported within the region.

## 6.5 Training and Exercises

Implementing effective training and exercise programs to practice communications interoperability is essential for ensuring that the technology works and responders are able to effectively communicate during emergencies. Optimal interoperability requires regular, comprehensive, and realistic exercises that address potential problems in the region and involve the participation of all personnel. It is the responsibility of each county/agency/jurisdiction to ensure adequate training and exercise opportunities are available for all emergency responders, and that all responding emergency responders are adequately trained.

Any training and exercises in multi-jurisdictional, multi-agency, and multi-discipline incident response MUST include the communications function to ensure that emergency responders are able to communicate effectively. When planning and scheduling incident management training and exercises, emergency managers in the UASI should include Communications Unit personnel. In addition to including the communications personnel in training and exercises, the exercises should include functional testing of communications equipment whenever possible.

At its regularly scheduled meetings, the ICC should identify all jurisdictional and/or individual agency training and exercise concerns. Training sessions should be identified and/or scheduled at the earliest opportunity to address these specific concerns. These training sessions may range from on-site drills with an individual agency to a region-sponsored exercise.

### 6.5.1 Communications Exercises

An exercise is a focused practice activity that places the participants in a simulated situation requiring them to function in the capacity that would be expected of them in a real event. Its purpose is to promote preparedness by testing policies and plans, and training personnel.

Exercises are conducted to evaluate an organization's capability to execute one or more portions of its response plan or contingency plan. Many successful responses to emergencies over the years have demonstrated that exercising pays huge dividends when an emergency occurs.

There are five main types of activities in a comprehensive exercise program:

- Orientation seminar
- Drill
- Tabletop exercise
- Functional exercise
- Full-scale exercise

As the name suggests, the orientation seminar is merely an overview or introduction to interoperable communications systems and procedures. Its purpose is to familiarize participants with roles, plans, procedures, or equipment. It can also be used to resolve questions of coordination and assignment of responsibilities.

A drill is a coordinated, supervised exercise activity, normally used to test a single specific operation or function such as a gateway, mobile communications vehicle, or interoperable shared channel testing. With a drill, there is no attempt to coordinate organizations or fully activate emergency operations centers (EOCs). Its role in an exercise program is to practice and perfect one small part of the response plan and help prepare for more extensive exercises in which several functions will be coordinated and tested. The effectiveness of a drill is its focus on a single, relatively limited portion of the overall emergency management system. It also has value in making a tight focus on a potential problem area.

A tabletop exercise is a facilitated analysis of an emergency situation in an informal, stress-free environment. It is designed to elicit constructive discussion as participants examine and resolve problems based on existing operational plans and identify where those plans need to be refined. The success of the exercise is largely determined by group participation in the identification of problem areas.

A functional exercise is a fully simulated interactive exercise that tests the capability of an organization to respond to a simulated event. The exercise tests multiple functions of the organization's operational plan. It is a coordinated response to a situation in a time-pressured, realistic simulation.

A full-scale exercise simulates a real event as closely as possible. It is an exercise designed to evaluate the operational capability of emergency management systems in a highly stressful environment that simulates actual response conditions. To accomplish this realism, it requires the mobilization and actual movement of emergency personnel, equipment, and resources. Ideally, the full-scale exercise should test and evaluate most functions of the emergency management plan or operational plan.

All these exercises can be structured to test interoperable communications capabilities, including those between public safety and non-public safety agencies. The cost of orientation seminars, drills, and tabletop exercises can vary from inexpensive locally-developed training programs to contracted tabletop exercises.

### 6.5.2 Dispatch and Emergency Responder Training

If dispatchers and emergency responders are to effectively use their interoperable communications resources, they must be provided with SOPs and trained in the use of the resources. Public safety personnel typically understand how to utilize existing resources to meet their day-to-day interoperable communications requirements. It is when confronted with major incidents requiring multi-agency, multi-jurisdictional and multi-discipline communications that they are more likely to be unable to effectively utilize existing resources.

Some good SOPs were identified within the region. The *OakWIN User's Guide* provides detailed instructions to OakWIN users in how to utilize the OakWIN system, including the NetworkFirst® gateway. Having good SOPs, however, is just part of the process. All personnel must receive training in the SOPs and practice the procedures. In other counties where users are transitioning to MPSCS, guidelines are being developed for system users.

There no evidence that the 2006 TICP was ever disseminated to emergency responders or that any training was conducted pursuant to the development of the TICP.

The SEMI UASI ICC can take the lead in developing regional SOPs and recommending that they be adopted by counties and local agencies. The committee can develop training programs for dispatch personnel and emergency responders. However, public safety agency administrators at the local level must adopt the SOPs and incorporate them into agency policies and procedures if they are to be effective. As indicated above, L.R. Kimball recommends the development of county-level interoperability governance structures to push interoperability governance down to the agency level. Developing local-level SOPs and TICPs based on the regional SOPs and TICP will help to communicate this critical information to the operational level where it is needed.

### 6.5.3 Scheduled Drills and Equipment Testing

There are many ways to schedule drills to provide personnel the opportunities to use and test interoperable resources. One way is to schedule weekly tests of interoperable radio channels by dispatch personnel. These tests can check the functionality of the channels between the dispatch center and public safety users and between dispatch centers. Scheduled tests of interoperable gateways and cache radios should also be conducted.

All interoperable equipment should be functionally tested prior to being placed into service. Anecdotal reports received by L.R. Kimball indicated that some cache radios when deployed for actual operations were found not to have been programmed with all of the required interoperable channels and programmed incorrectly.

It was reported that in the past that various agencies in the UASI that maintain MCUs came together for a meeting with their MCUs. At this "mobile command post round-up," personnel from the various agencies displayed their equipment and demonstrated its use. This is not only an excellent drill, but familiarizes other communications personnel with the resources that are available within the region. Such an event might take place in conjunction with

a regularly scheduled meeting of the ICC once a year. This would also familiarize members of the committee with the various MCUs in the region and assist in identifying equipment and training needs.

### 6.5.4 Communications-specific Tabletop Exercise

To advance training and exercises, DHS has developed a methodology for communications-focused, multi-agency tabletop exercises. This methodology is described in a DHS publication entitled *Communications-Specific Tabletop Exercise Methodology*. This is a guide for conducting tabletop exercises that will lead to the identification of communications gaps and improvements to address those gaps. The *Communications-Specific Tabletop Exercise Methodology* is intended to help local communications officials plan, conduct, and evaluate communications-specific exercises in collaboration with the emergency response community. A communications-specific tabletop exercise is a forum to evaluate current communications plans, communications concepts, resources, and interoperable capabilities. Such exercises can help the UASI identify interoperability capabilities and gaps in existing processes. This document can be downloaded at:

http://www.safecomprogram.gov/NR/rdonlyres/C67306E9-3C28-4654-91A5-0CDFD6D3DE55/0/CommunicationsSpecificTabletopExerciseMethodology.pdf

The UASI can use the DHS tabletop exercise guidelines to develop tabletop exercises to be conducted at the local and county level to involve public safety agencies in interoperable communications.

### 6.5.5 Functional Exercises

The most effective type of exercise is the functional training exercise. L.R. Kimball suggests the SEMI UASI ICC execute a functional training exercise designed to validate the information and procedures in the Regional TICP developed in the previous phases of the project. A functional exercise, as defined by the DHS in the Homeland Security and Exercise Evaluation Program (HSEEP), is focused on exercising plans, policies, procedures and staff involved in management, direction, and command and control functions. Such a functional exercise would involve non-public safety agencies as well as public safety agencies.

Events are projected through an exercise scenario with event updates that drive activity at the management level. A functional exercise is conducted in a realistic, real-time environment; however, movement of personnel and equipment is simulated.

An important aspect of the exercise is to observe and document the actions and issues occurring during the exercise to produce a HSEEP-compliant After Action Report (AAR) based on data collected from all exercise participants, controller observations and evaluator reports. During the exercise, evaluators or recorders take notes and collect participant impressions during this process. Formal written documentation is provided and collected from each participant on an exercise evaluation form; follow-up conversations with key participants are held to clarify information provided verbally or on the evaluation forms, as necessary. These inputs and findings should then be compiled and analyzed to form the basis of an exercise AAR that identifies strengths and weaknesses and an Improvement Plan.

The exercise should be based on HSEEP guidance and templates. Costs to be considered would be:

- Exercise design
- Exercise evaluation
- AAR
- Gap Analysis Report
- Location, meals and related during the exercise

The budgetary estimate for a comprehensive approach using the objectives described above should be considered at approximately $40,000 to $50,000. Depending on funding availability for multiple functional exercises, it would be desirable to conduct functional exercises in each county and the city of Detroit to allow participation by more individual agencies.

## 6.6 PSAP Consolidation

Within the SEMI UASI, PSAPs per county range from one to forty. The counties with the most PSAPs are Wayne County with 40 and Oakland County with 27. The issues associated with PSAP consolidation are complex and any analysis of the costs and benefits of PSAP consolidation in the SEMI UASI is beyond the scope of this project. However, the number of different dispatch centers adds to the challenges of communications interoperability.

Where console patches are necessary to achieve interoperability with disparate radio system in surrounding jurisdictions, each dispatch center must have access to all of the necessary conventional channels and trunked talkgroups. Generally, smaller centers have console access to only their own local conventional channels and local talkgroups. Hence, access to radio resources may be limited in smaller centers.

Ensuring that all dispatch personnel are adequately trained in interoperability procedures in a multi-PSAP environment is a challenge. Currently, if a dispatch center in Oakland County requires a patch to an MPSCS talkgroup, dispatch personnel must know which MPSCS talkgroup with which to patch and must call Livingston County to initiate the patch. Even if Oakland County installs an MPSCS console at one central dispatch center (e.g., the Oakland County Sheriff's Office dispatch center) each of the 26 other dispatch centers will have to rely upon the Sheriff's Office dispatch center to initiate the appropriate patches upon request.

L.R. Kimball believes that interoperable communications would be improved by having fewer individual dispatch centers in the UASI. Agencies are encouraged to explore the potential benefits of PSAP consolidation.

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# 7. SUMMARY

The following are the major recommendations for addressing the interoperability gaps identified in the SEMI UASI:

- Provide a single shared standards-based radio system for all emergency responders in Wayne County that will provide interoperability both within the county and with surrounding jurisdictions. This will require the build out of MPSCS infrastructure in Wayne County and should include:
  - Merging the existing Detroit Metropolitan Airport P25 trunked radio system into the Wayne MPSCS sub-system
  - Migrating all existing public safety radio systems in Wayne County onto MPSCS
- Any new radio systems in the UASI should be P25 compliant shared systems.
- MPSCS and other P25 systems in the UASI should be interconnected using the RF ISSI.
- Provide an MPSCS radio console to the Oakland County Sheriff's Central Dispatch to enable Oakland County to initiate its own patches between MPSCS talkgroups and OakWIN talkgroups. Redesign the gateway connection as necessary to facilitate this change.
- Install P25 software in selected radios in Oakland County and provide MPSCS access for these radios to permit interoperability with MPSCS users.
- Encourage the development of county-level interoperability governance structures to promote agency-level participation in interoperability governance. Encourage counties to develop county-level TICPs based on the regional TICP.
- Review and adopt DHS model SOPs for use of regional interoperable resources and encourage their adoption by agencies to govern the use of gateways, use of console patches, and the operation and maintenance of radio caches.
- Encourage the development of dispatcher and emergency responder training programs based on the UASI TICP and adopted SOPs.
- Train additional COMLs in the UASI and involve the COMLs in structured incident response systems and support them in the COML certification process. Encourage all agencies operating MCUs to have at least two COMLs available for deployment with the MCU.
- Assess the costs and benefits of having additional deployable mutual aid infrastructure in the form of an SOW equipped with antenna mast, mutual aid repeaters and base stations, gateway, and console.
- Encourage the development of a second CST in the region or expansion of the existing MABAS CST to provide communications support to two major incidents in the UASI simultaneously.
- Require that any radio equipment funded by the UASI have sufficient channel capacity to program all VHF High Band, UHF, and 800 MHz national mutual aid channels and require that they be programmed with these channels. Standardized channel names should be used for all national mutual aid channels when programmed into subscriber equipment.
- Encourage all VHF High Band and UHF users in the UASI to add the national mutual aid channels during any reprogramming required prior to January 1, 2013 to transition to narrowband operation.
- Program all mobile radios used in MCUs with gateway devices for on-scene incident management with all national mutual aid channels, Michigan "common" channels, Michigan MABAS channels, and all HERN and UHF MED channels.

- Require that all cache radios approved for use in the UASI be programmed with all national mutual aid channels, Michigan "common" channels, Michigan MABAS channels, and all HERN and UHF MED channels.
- Work with the Region 21 700 MHz Regional Planning Committee to develop a prioritized list of 700 MHz national mutual aid channels to be used for interoperability in the UASI.
- Encourage emergency managers to include communications unit personnel in all multi-agency, multi-jurisdictional and multi-discipline training and exercises.
- Each county and agency maintaining a dispatch center should ensure proper training of dispatch personnel in interoperability SOPs and use of available resources.
- Regular drills should be scheduled to allow personnel to use interoperable communications equipment and to test the functionality of the equipment.
- A full functional exercise to test and exercise the SEMI UASI TICP should be conducted. Additional functional exercises in each county and the city of Detroit are desirable to permit more individual agency participation in a functional exercise.
- Request MPSCS to consider the costs and benefits of adding a tower site in the Pontiac area to improve MPSCS coverage in Oakland County.

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# APPENDIX A–OAKLAND COUNTY NETWORKFIRST® INTEROPERABLE GATEWAY DESIGN

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# APPENDIX B–MICHIGAN PUBLIC SAFETY COMMUNICATIONS SYSTEM AUDIO PATCH AND GATEWAY INTEROPERABILITY POLICY

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# APPENDIX C–MICHIGAN PUBLIC SAFETY COMMUNICATIONS SYSTEM FEE STRUCTURE

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# APPENDIX D–DEPARTMENT OF HOMELAND SECURITY STANDARD OPERATING PROCEDURE TEMPLATES FOR INTEROPERABLE RESOURCES

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# Shared System Standard Operating Procedure Template

| | | | |
|---|---|---|---|
| PROCEDURE TITLE:<br>Shared System | DOCUMENT SECTION:<br>Interoperable Standards | SUBSECTION:<br>Shared System | NUMBER:<br>01-1.4 |
| ORIGINAL DATE ISSUED: | DATE ISSUED: | EFFECTIVE DATE: | CROSS-REFERENCED SOPs: |
| OPERATIONAL AND TECHNICAL COMMITTEE APPROVAL: | DATE APPROVED: | GOVERNANCE BOARD APPROVAL: | DATE APPROVED: |

For the purpose of this Standard Operating Procedure (SOP), a Shared System is defined as a system used by multiple agencies and multiple jurisdictions (e.g., statewide, regional, or county radio systems) where radios communicate with each other over a common infrastructure using the standards-based system of systems approach. Typically, a shared system will be used exclusively by emergency responders for communications during regional/local incidents, planned events, and multi-agency, multi-jurisdictional emergencies. Shared systems can also be set up for everyday use and are often established by multiple agencies to assist in a cost sharing opportunity (e.g., a regional or local agency utilizing an existing statewide system for the basis of their primary radio system). This SOP will help define operating procedures on the shared system. However, because shared systems are agreed to by multiple parties in advance of emergencies or incidents, it is recommended that a Memorandum of Understanding (MOU) be executed in advance of the SOP to establish the Shared System Use Authority. As defined by the Department of Homeland Security, use of a standards-based shared system constitutes achievement of the optimal level of interoperability along the Technology lane of the SAFECOM Interoperability Continuum.

## Shared System
## [Insert site names]
## Standards, Protocols, Procedures

1. Purpose/Objectives

   Establish SOPs for the use of a shared system. The intent of this protocol is to establish an orderly, workable radio resource for the use of operational, as well as command and control, personnel in everyday response, mutual aid response, or in the event of a major response, ranging from an intra-discipline, intra-jurisdictional incident or event, to an inter-discipline, inter-jurisdictional incident or event in [insert area here]. The communications capabilities provided by the shared system will be in operation for [insert entity or agency here], [insert entity or agency here], and [insert entity or agency here] using [insert shared system here].

The objective is to have a SOP in place for pre-established radio resources in support of incident driven interoperable communications as authorized by a pre-existing Shared System Use Authority MOU.

2. Technical Background

The shared system [insert shared system here] with shared channels [insert name(s)/frequency(s) here] has been designated the [insert common name(s) here] to give communications capabilities to command and operational personnel responsible for the response to a regional incident requiring multiple jurisdictions and services.

This is intended to support multi-agency, multi-jurisdictional communications capabilities during mutual aid incidents and events.

The shared system also serves as a primary, local, everyday use system for [insert entity or agency here], [insert entity or agency here], and [insert entity or agency here].

3. Operational Context

Established mutual aid response protocols between [insert entity or agency here], [insert entity or agency here], and [insert entity or agency here] will provide the basis for operational activation of the shared system. The following is a hierarchy of projected operational needs based on priority, with the first operation holding the highest priority:

- A large-scale emergency incident that requires a multi-agency, multi-jurisdictional response (e.g., a natural disaster such as a hurricane, a terrorist incident involving weapons of mass destruction).
- Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies (e.g., high-speed pursuits crossing jurisdictional boundaries, a large warehouse fire requiring mutual aid response).
- Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies (e.g., a large sporting event such as a college football game, a dignitary visit).
- Drill, maintenance, and test exercises.

4. Recommended Protocol/Standard

The following bullets define the basic standards that should be in place during the use of an interoperability resource within a shared system:

- National Incident Management System – Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.
- Unit Identification – Announce your home agency prior to announcing your unit identifier during interoperable communications situations when utilizing the designated talkgroup(s) or channel(s).
- Encryption – Encryption is not recommended for use on system interoperability talkgroup(s) or channel(s). If all potential users have access to the encrypted system, then the use of encryption may be appropriate.

- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander, or his/her designee, will ensure that each interoperability talkgroup or channel is monitored while in use. In a smaller mutual aid response, the Agency Lead may also require that each interoperability talkgroup or channel be monitored.

5. Recommended Protocol Procedure

### Dispatch Center Responsibility

The dispatch center of the agency initiating the incident is responsible for all primary dispatch tasks unless the decision is made by the Incident Commander, Agency Lead, or the incident dispatch center to transfer the responsibilities to another center where authorized.

Shared System Interoperability Resource Request

The agency requesting the use of interoperability resources of the shared system for incident or event communications support should provide the following information to the agency supporting the operation:

- What agencies and entities are involved?
- Who has the responsibility for incident command—or, who is the lead relevant to the mutual aid request?
- Which interoperability resources are required?
- How long do the emergency responders need to be operating on the interoperability resources?
- Do the designated talkgroup(s) or channel(s) require monitoring? If so, who (e.g., dispatch center, incident command, Radio Operator [RADO]) will serve as the responsible agent?
- What is the primary purpose (e.g., command and control, tactical response, logistical support) of the interoperability resources?

### Shared System Interoperability Resource Activation

Once interoperability resources of the shared system are identified, the procedures for establishing communications connectivity are:

- Select the predetermined talkgroup(s) or channel(s) for use.
- Verify the system-wide availability of required resources (coordinate among control point dispatchers).
- Provide radio call sign/designator information to user agencies as necessary.
- Notify the requested unit/agency of the resource availability.
- Notify the responding units to the appropriate talkgroup(s) or channel(s) and have the units switch to the designated interoperability resources, if required.
- Confirm responding units are operating on the appropriate talkgroup(s) or channel(s).
- Identify users on the talkgroup(s) or channel(s) using their agency name and unit identifier through a roll call when appropriate (users in a secure setting or a mutual aid response may not require dispatcher validation).
- Announce to users at predetermined time intervals, specifically [insert time interval here], that interoperable communications procedures are in effect as deemed necessary by the Incident Commander or Agency Lead.
- Monitor the talkgroup(s) or channel(s) to address requests as required.
- Monitor the talkgroup(s) or channel(s) for problems that may require technician intervention.
- Monitor for system problems.
- Record the talkgroup(s) or channel(s), if required or where appropriate.

### Shared System Interoperability Resource Deactivation

When the interoperability resources of the shared system are no longer required, agencies should follow these deactivation procedures:

- The supporting agencies identify the shared system channel(s) as no longer needed or in use.
- Announcement will be made over the shared system that use of the interoperability resources will be operationally discontinued.
- Prior to discontinuing the use of interoperability resources, agencies should ensure that all personnel have returned to their appropriate home talkgroup(s) or channel(s)
- Agencies may want to conduct a roll call of all affected personnel to confirm they returned to their home talkgroup(s) or channel(s).
- After deactivation of the interoperability resources, normal operations should be resumed.

### Shared Channel Problem ID and Resolution

- Report any problems with the shared system to the appropriate point of contact (POC) for that agency.
- A routine shared system test schedule should be established [daily/weekly/monthly] to confirm availability and operational use.
- After action reports should be utilized to help identify potential problems and prospective solutions.

## 6. Management

The cooperating agencies are responsible for the operational management of their system. A governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

# Shared System Standard Operating Procedure Template

| PROCEDURE TITLE: | DOCUMENT SECTION: | SUBSECTION: | NUMBER: |
|---|---|---|---|
| Shared Channel | Interoperable Standards | Shared Channel | 01-1.3 |
| ORIGINAL DATE ISSUED: | DATE ISSUED: | EFFECTIVE DATE: | CROSS-REFERENCED SOPs: |
| OPERATIONAL AND TECHNICAL COMMITTEE APPROVAL: | DATE APPROVED: | GOVERNANCE BOARD APPROVAL: | DATE APPROVED: |

For the purpose of this Standard Operating Procedure (SOP), Shared Channels, also referred to as Shared Talkgroups (trunked radios systems) and/or Mutual Aid Channels/Talkgroups, is defined as channels that are pre-established regionally and are pre-programmed in a radio intended to interoperate. They will typically be used exclusively by emergency responders for communications during local/regional incidents, planned events, and multi-agency, multi-jurisdictional emergencies. This SOP will assist in the definition of how to operate on the shared channel. However, because shared channels are agreed to by multiple parties in advance of any emergency or incident, it is recommended that a Memorandum of Understanding (MOU) be executed in advance of the SOP to establish the Shared Channel Use Authority. This SOP uses the term "shared channels" to represent "shared channels," "mutual aid channels," "shared talkgroups," and "mutual aid talkgroups" as they relate to a regional shared channel plan and does not focus on national mutual aid channels.

## Shared Channel
## [Insert site names]
## Standards, Protocols, Procedures

1. Purpose/Objectives

   Establish SOPs for the use of a shared channel. The intent of this protocol is to establish an orderly, workable radio resource for the use of operational, as well as command and control, personnel in everyday mutual aid response or in the event of a major response, ranging from an intra-discipline, intra-jurisdictional incident or event, to an inter-discipline, inter-jurisdictional incident or event in [insert area here]. The communications capabilities provided by the shared channel will be in operation for [insert entity or agency here], [insert entity or agency here], and [insert entity or agency here] using [insert shared channel here], [insert shared channel here], and [insert shared channel here]. The objective is to have a SOP in place for pre-established radio resources in support of incident driven interoperable communications as authorized by a pre-existing Shared Channel Use Authority MOU.

2. Technical Background

The shared channel [insert name(s)/frequency(s) here] has been designated the [insert common name(s) here] channel to give communications capabilities to command and operational personnel responsible for the response to a regional incident requiring multiple jurisdictions and services.

This is intended to support multi-agency, multi-jurisdictional communications capabilities during mutual aid incidents and events.

3. Operational Context

Established mutual aid response protocols between [insert entity or agency here], [insert entity or agency here], and [insert entity or agency here] will provide the basis for operational activation of the shared channel(s). The following is a hierarchy of projected operational needs based on priority, with the first operation holding the highest priority:

1. A large-scale emergency incident that requires a multi-agency, multi-jurisdictional response (e.g., a natural disaster such as a hurricane, a terrorist incident involving weapons of mass destruction).
2. Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies (e.g., high-speed pursuits crossing jurisdictional boundaries, a large warehouse fire requiring mutual aid response).
3. Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies (e.g., a large sporting event such as a college football game, a dignitary visit).
4. Drill, maintenance, and test exercises.

4. Recommended Protocol/Standard

The following bullets define the basic standards that should be in place during the use of the shared channel(s):

- National Incident Management System – Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.
- Unit Identification – Announce your home agency prior to announcing your unit identifier during interoperable communications situations when utilizing the shared channel(s).
- Encryption – All encrypted radio users must operate in a "clear" mode when a shared channel is used, unless otherwise arranged in advance. If all potential users have access to the encrypted channel(s), then the use of encryption may be appropriate.
- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander, or his/her designee, will ensure that the shared channel(s) is/are monitored while in use. In a smaller mutual aid response, the Agency Lead may also require that the shared channel(s) be monitored.

## 5. Recommended Protocol Procedure

### Dispatch Center Responsibility

The dispatch center of the agency initiating the incident is responsible for all primary dispatch tasks unless the decision is made by the Incident Commander, Agency Lead, or the incident dispatch center to transfer the responsibilities to another center where authorized.

### Shared Channel Request

The agencies using the shared channel(s) for incident or event communications support should provide the following information to the agency supporting the operation:

- What agencies and entities are involved?
- Who has the responsibility for incident command—or, who is the lead relevant to the mutual aid request?
- Which shared channel(s) will be used?
- How long do the emergency responders need to be operating on the shared channel(s)?
- Does the connection require monitoring? If so, who (e.g., dispatch center, incident command, Radio Operator [RADO]) will serve as the responsible agent?
- What is the primary purpose (e.g., command and control, tactical response, logistical support) of the shared channel(s)?

### Shared Channel Activation

Once shared channel resources are identified, the procedures for establishing communications connectivity are:

- Select the predetermined channel(s) for use.
- Verify the system-wide availability of required resources (coordinate among control point dispatchers).
- Provide radio call sign/designator information to connected agencies as necessary.
- Notify the requested unit/agency of the channel(s) availability.
- Notify the responding units to the appropriate talkgroup and have the units switch to the designated shared channel(s), if required.
- Confirm responding units are operating on the appropriate shared channel(s).
- Identify users on the shared channel(s) using their agency name and unit identifier through a roll call when appropriate (users in a secure setting or a mutual aid response may not require dispatcher validation).
- Announce to users at predetermined time intervals, specifically [insert time interval here], that shared channel and interoperable communications procedures are in effect as deemed necessary by the Incident Commander or Agency Lead.
- Monitor the shared channel(s) to address requests as required.
- Monitor the shared channel(s) for problems that may require technician intervention.
- Monitor for system problems that may require a deactivation of the shared channel(s).
- Record the shared channel(s), if required or where appropriate.
- Monitor designated calling channel where required.

### Shared Channel Deactivation

When the shared channel(s) are no longer required, agencies should follow these deactivation procedures:

- The supporting agencies identify the shared channel(s) as no longer needed or in use.
- Announcement will be made over the shared channel(s) that use of the channel(s) will be operationally discontinued.
- Prior to discontinuing the use of the shared channel(s), agencies should ensure that all personnel have returned to their appropriate home systems, talkgroups, or channels.
- Agencies may want to conduct a roll call of all affected personnel to confirm they returned to their home systems.
- After deactivation of the shared channel(s), normal operations should be resumed.

### Shared Channel Problem ID and Resolution

- Report any problems with the shared channel(s) to the appropriate point of contact (POC) for that agency.
- A routine shared channel(s) test schedule should be established [daily/weekly/monthly] to confirm availability and operational use.
- After action reports should be utilized to help identify potential problems and prospective solutions.

## 6. Management

The cooperating agencies are responsible for the operational management of their system. A governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

# Radio Cache Standard Operating Procedure Template

| PROCEDURE TITLE: | DOCUMENT SECTION: | SUBSECTION: | NUMBER: |
|---|---|---|---|
| Shared Channel | Interoperable Standards | Shared Channel | 01-1.3 |
| ORIGINAL DATE ISSUED: | DATE ISSUED: | EFFECTIVE DATE: | CROSS-REFERENCED SOPs: |
| OPERATIONAL AND TECHNICAL COMMITTEE APPROVAL: | DATE APPROVED: | GOVERNANCE BOARD APPROVAL: | DATE APPROVED: |

For the purpose of this Standard Operating Procedure (SOP), a Radio Cache is defined as a store of primarily field deployable portable radios along with other wireless assets (e.g., mobile radios, cell phones, wireless Internet, satellite [SAT] phones) and ancillary support equipment such as batteries and chargers. These assets are generally deployed at the scene of an incident or event, which allows users, such as Incident Management Teams (IMT) and police, fire, and Emergency Medical Services (EMS) responders, to have the ability to establish necessary communications. Using these radios allows all responders to use common, compatible equipment during an incident. A radio cache is the basic level of interoperability between multiple agencies and responders.

## Radio Cache
## [Insert site names]
## Standards, Protocols, Procedures

1. Purpose/Objectives
   Establish SOPs for the use of a radio cache to support communications interoperability between emergency responders at the scene of an incident or event. The communications resources provided by the radio cache facilitate communications between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) in need of interoperability. The objective is to have a SOP in place for [insert entity or agency here] to have pre-established procedures for the utilization of radio cache resources that are made available to external responding on-scene agencies with the need to interoperate during an event or incident.
2. Technical Background
   A radio cache comprised of [insert number here] standby radios can be deployed to support regional incidents. These radios may be from a regional cache or from a participating agency. Responding agencies A radio cache comprised of [insert number here] standby radios can be deployed to support regional incidents. These radios may be from a regional cache or from a participating agency. Responding agencies (Federal, State, regional, etc.) will have access to the cache resources to support multi-agency, multi-jurisdictional communications

capabilities during mutual aid incidents and events. The cache of radios has been programmed to operate on [insert talkgroups, channels, frequencies, or systems here]. The cache is deployed with the following technical resources: [Insert technical personnel, available equipment, etc. here].

3. Operational Context

Established mutual aid response protocols between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) will provide the basis for operational deployment of the radio cache. The following is a hierarchy of projected operations based on priority, with the first operation holding the highest priority:

1. A large-scale emergency incident that requires a multi-agency, multi-jurisdictional response (e.g., a natural disaster such as a hurricane, a terrorist incident involving weapons of mass destruction).
2. Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies (e.g., a hostage situation, a large warehouse fire requiring mutual aid response).
3. Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies (e.g., a large sporting event such as a college football game, a dignitary visit).
4. Drill, maintenance, and test exercises.

4. Recommended Protocol/Standard

The following bullets define the basic standards that should be in place during the use of a radio cache:

- National Incident Management System – Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.
- Unit Identification – Announce your home agency prior to announcing your unit identifier during interoperable communications situations when utilizing the radio cache.
- Encryption – Use of encryption is not recommended for general interoperability. If all potential users have access to the encrypted system, then the use of encryption may be appropriate. There are operational needs that may require the use of encryption (secure communication) such as those needs associated with special operations, narcotics interdiction, or SWAT team activities.
- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander, or his/her designee, will ensure that each channel or talkgroup used for interoperability is monitored while in use. In a smaller mutual aid response, the Agency Lead may also require that each channel or talkgroup be monitored.
- Equipment Accountability – Agencies utilizing the radio cache are responsible for the use and return of equipment as dictated by existing agreements, Memorandum of Understanding (MOU), and/or field-specific asset deployment instructions.

## 5. Recommended Protocol Procedures

### Dispatch Center Responsibility

The dispatch center of the agency initiating the incident is responsible for all primary dispatch tasks unless the decision is made by the Incident Commander, Agency Lead, or the incident dispatch center to transfer the responsibilities to another center where authorized.

### Radio Cache Request

The Incident Commander, or the Agency Lead, determines when a situation exists that requires the use of a radio cache and notifies the appropriate radio cache manager or agency (e.g., a State Department of Emergency Management). The responsible entity will follow internal agency procedures to contact the Communications Unit Leader (COML), or supporting agency point of contact [insert name and 24 hour contact number here], and relay pertinent information regarding the event. The requesting agency should provide the following information to the agency managing the radio cache:

- Requesting agency name, contact information, and appropriate authorization verification (e.g., name of authorized user, name of lead responder for this agency, security credentials).
- Identification of requesting agency command (e.g., Fire Chief, Emergency Manager, or lead relevant to the radio cache request).
- Reason for requesting the radio cache/type of event (e.g., wild land fire, hurricane).
- Primary purpose of the use of the radio cache (e.g., command and control, tactical response, logistical support).
- Type of radio cache assets required.
- Quantity of radio cache assets required.
- Expected duration of the event.
- Required location/access information.
- User/requestor and/or servicing dispatch contact phone number.
- Whether or not the voice communications require monitoring. If it does, name of the responsible agent (e.g., dispatch center, Incident Commander, Radio Operator [RADO]).
- Additional support services (e.g., technician, chargers) requested.

The supporting agency determines what radio cache assets are available for use, identifies a specific cache, activates that cache, and coordinates the cache deployment with the requesting agency's Incident Commander or Agency Lead.

### Radio Cache Activation

Upon receiving a request for the deployment of a radio cache, the supporting agency should follow these deployment procedures:

- Contact the person responsible for radio cache deployment.
- Verify the availability of required resources (coordinate among control point dispatchers, if applicable).
- Coordinate delivery of the radio cache to the scene or arrange for pick up.
- If appropriate, inform the requesting agency that the radio cache is en route and provide an estimated time of arrival (ETA), if available.

The person and/or team responsible for the deployment of the radio cache should follow these deployment procedures:

- If appropriate, provide dispatch or requesting Agency Lead with an ETA to the scene of the incident.
- Ready the radio cache and deploy to the incident scene if on-site deployment is required. If requesting agency will pick up the radio cache assets, then prepare a pick up location.
- If deployed, report to the Incident Commander or Agency Lead upon arrival.
- Once on-scene, assign the cache to the requesting agency for incident use or, if assigned to remain on-scene, coordinate radio cache deployment procedures with the Communications Unit.
  - Each radio in the radio cache should have a unique identification number for inventory tracking. Ask the lead for the receiving agency to sign a Radio Cache Asset Deployment Form.

The requesting Incident Commander, Agency Lead, or Communications Unit Leader will be responsible for:

- Supporting radio deployments on-scene.
- Maintaining a record of each user and agency to whom a radio and associated accessories have been distributed.
- Documenting the identification number of each radio deployed.
- Documenting the talkgroup(s) or channel(s) in use from the predetermined talkgroup(s) or channel(s).
- Provide radio call sign/designator information to responding agencies as necessary.
- Notify the responding units of where to obtain a cache radio on-scene and which talkgroup(s) or channel(s) to use for the incident or event.
- Confirm responding units are operating on the appropriate talkgroup(s) or channel(s).
- Identify users on the interoperability talkgroup(s) or channel(s) using their agency name and unit identifier through a roll call when appropriate (users in a secure setting or a mutual aid response may not require dispatcher validation).
- Announce to users at predetermined time intervals, specifically [insert time interval here], that interoperability communications procedures are in effect as deemed necessary by the Incident Commander or Agency Lead.
- Monitor the interoperability talkgroup(s) or channel(s), if applicable, to address requests as required.
- Monitor the system for problems that may require technician intervention.
- Record the talkgroup(s) or channel(s), if required or where appropriate.

Each user and/or agency that receives a radio from the radio cache will be responsible for returning that radio, and all associated accessories, to the cache at the end of the incident.

### Radio Cache Deactivation

When the radio cache is no longer required, agencies should follow these deactivation procedures:

- The authorizing requesting agent requests the radio cache be deactivated.
- An announcement will be made over the interoperability talkgroup(s) or channel(s) that the radio cache will be deactivated.
- Prior to radio cache deactivation, agencies should ensure that all personnel have returned to their appropriate home systems, talkgroup(s), or channel(s).

- Agencies may want to conduct a roll call of all affected personnel to confirm they returned to their home systems.
- After deactivation of the radio cache, normal operations should be resumed.
- Coordinate the return of all cache radios to the Communications Unit through the Incident Commander or the Agency Lead.
- The Communications Unit will be responsible for inventorying all radios and accessories returned to the cache. Before leaving the incident scene, the Communications Unit will determine if any radios have not been returned to the radio cache and note the user and agency to which the radio was distributed. This information will be provided to the Incident Commander or his/her designee.
- If the missing radios cannot be recovered at the incident scene, the Communications Unit will provide this information to the supporting agency radio cache manager or point of contact (POC) for resolution.

Radio Cache Problem ID and Resolution

- Report any problems with the radio cache to the radio cache manager or appropriate POC for the agency responsible for the radio cache.
- A routine radio cache maintenance and test schedule should be established [daily/weekly/monthly] to confirm availability and operational readiness.
- After action reports should be utilized to help identify potential problems and prospective solutions.

6. Management

The cooperating agencies are responsible for the operational management of their system. A governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

# System-to-System Console Patch Standard Operating Procedure Template

| PROCEDURE TITLE: | DOCUMENT SECTION: | SUBSECTION: | NUMBER: |
|---|---|---|---|
| System-to-System Console Patch | Interoperable Standards | Console Patch | 01-1.1 |
| ORIGINAL DATE ISSUED: | DATE ISSUED: | EFFECTIVE DATE: | CROSS-REFERENCED SOPs: |
| OPERATIONAL AND TECHNICAL COMMITTEE APPROVAL: | DATE APPROVED: | GOVERNANCE BOARD APPROVAL: | DATE APPROVED: |

For the purpose of this Standard Operating Procedure (SOP), a System-to-System Console Patch is defined as a console based connection to tie in pre-established disparate radio resources available to the radio dispatcher on their radio dispatch console. This allows mobile users such as Incident Management Teams (IMT) and police, fire, and emergency medical services (EMS) to establish necessary interoperability through predetermined talkgroup(s) or channel(s).

## System-to-System Console Patch
## [Insert site names]
## Standards, Protocols, Procedures

1. Purpose/Objectives
   Establish SOPs for the use of a console patch to tie in pre-established disparate radio resources available to the radio dispatcher on their radio dispatch console. The console patch will be between [insert entity or agency here] and [insert entity or agency here] using the [insert radio resource here] patched to the [insert radio resource here]. The objective is to have a SOP in place for pre-established radio resources in support of incident-driven interoperable communications.
2. Technical Background
   A console patch between [insert entity or agency here] and [insert entity or agency here] will enable the use of up to [insert number here] talkgroups and/or channels. There is a [insert type of connection here] connecting the [insert radio resource here] to [insert radio resource here] to support multi-agency, multi-jurisdictional communications capability during mutual aid incidents.
3. Operational Context

Established mutual aid response protocols between [insert entity or agency here] and [insert entity or agency here] will provide the basis for operational activation of the console patch. The following is a hierarchy of projected operations based on priority, with the first operation holding the highest priority:

1. A large-scale emergency incident that requires a multi-agency, multi-jurisdictional response (e.g., a natural disaster such as a hurricane, a terrorist incident involving weapons of mass destruction).
2. Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies (e.g., high-speed pursuits crossing jurisdictional boundaries, a large warehouse fire requiring mutual aid response).
3. Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies (e.g., a large sporting event such as a college football game, a dignitary visit).
4. Drill, maintenance, and test exercises.

4. Recommended Protocol/Standard

The following bullets define the basic standards that should be in place during the use of communications patching:

- National Incident Management System – Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.
- Unit Identification – Announce your home agency prior to announcing your unit identifier during interoperable communications situations initiated via console patching.
- Encryption – All encrypted radio users must operate in a "clear" mode when a console patch is used, unless otherwise arranged in advance. Never assume encryption carries between systems.
- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander, or his/her designee, will ensure that each activated console patch is monitored while in use. In a smaller mutual aid response, the Agency Lead may also require that each activated console patch be monitored.

5. Recommended Protocol/Procedures

Dispatch Center Responsibility

The dispatch center of the agency initiating the incident is responsible for all primary dispatch tasks unless the decision is made by the Incident Commander, Agency Lead, or the incident dispatch center to transfer the responsibilities to another center where authorized.

Console Patch Request

The agency requesting the use of a console patch for incident or event communications support should provide the following information to the agency supporting the operation:

- Name of the agency and appropriate authorization verification (e.g., name of authorized user, lead responder for this agency, security credentials) needed to request the patch.
- The agencies and entities involved.
- The responsible party for incident command—or, the lead relevant to the mutual aid request.
- The talkgroups/channels/radio resources required to be patched.
- The duration of the patch activation.
- The process for patch audio monitoring and the responsible agent for recording (e.g., dispatch center, Incident Commander, Radio Operator [RADO]).
- The designation or type of patch: "Command and Control" or "Tactical Operational."

### Console Patch Activation

Once agencies agree to cross-patch their radio resources, the procedures for establishing communications connectivity are:

- Select the predetermined talkgroup or channel for use in the console patch from both dispatch centers.
- Verify the system-wide availability of required resources (coordinate among control point dispatchers).
- Provide radio call sign/designator information to connected agencies as necessary.
- Notify the requested unit/agency of the talkgroup or channel availability.
- Notify the responding units to the appropriate talkgroup and have the units switch to the designated shared talkgroup or channel, if required.
- Confirm responding units are operating on the appropriate talkgroup or channel.
- Identify users on the patched talkgroup or channel using their agency name and unit identifier through a roll call when appropriate (users in a secure setting or a mutual aid response may not require dispatcher validation).
- Announce to users at predetermined time intervals, specifically [insert time interval here], that a system-to-system interagency patch is in place and interoperable communications procedures are in effect as deemed necessary by the Incident Commander or Agency Lead.
- Monitor the patched talkgroup or channel to address requests as required.
- Monitor the system for problems that may require technician intervention.
- Monitor for system problems that may require a patch deactivation.
- Record the talkgroup(s) or channel(s), if required or where appropriate.
- Monitor designated calling channel where required.

### Console Patch Deactivation

When the console connections are no longer required, agencies should follow these deactivation procedures:

- The authorizing agent requests the console patch be deactivated.
- Announcement will be made over patched talkgroups or channels that will be deactivated prior to the connection being disabled.
- Prior to console patch deactivation, agencies should ensure that all personnel have returned to their appropriate home talkgroups or channels.

- Agencies may want to conduct a roll call of all affected personnel to confirm they returned to their home systems.
- Patches should be deactivated. Talkgroups or channels should be returned to normal mode of operations.

Console Patch Problem ID and Resolution

- Report any problems with the console patch to the appropriate point of contact (POC) for that agency.
- A routine console patch test schedule should be established [daily/weekly/monthly] to confirm availability and operational use.
- After action reports should be utilized to help identify potential problems and prospective solutions.

6. Management

The cooperating agencies are responsible for the operational management of their system. A governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

# Mobile Gateway Standard Operating Procedure Template

| PROCEDURE TITLE: | DOCUMENT SECTION: | SUBSECTION: | NUMBER: |
|---|---|---|---|
| Mobile Gateway Patch | Interoperable Standards | Mobile Gateway | 01-1.2 |
| ORIGINAL DATE ISSUED: | DATE ISSUED: | EFFECTIVE DATE: | CROSS-REFERENCED SOPs: |
| OPERATIONAL AND TECHNICAL COMMITTEE APPROVAL: | DATE APPROVED: | GOVERNANCE BOARD APPROVAL: | DATE APPROVED: |

For the purpose of this Standard Operating Procedure (SOP), a Mobile Gateway Patch is defined as a system that allows mobile users, such as Incident Management Teams (IMT) and police, fire, and emergency medical services (EMS) command vehicles, to have the ability to establish the patches needed to cross-connect disparate wireless resources. Mobile gateways also provide users with the ability to control their radio/wireless resources from remote locations.

## Mobile Gateway Patch
## [Insert site names]
## Standards, Protocols, Procedures

1. Management

   Establish SOPs for the use of a mobile gateway to connect disparate wireless systems to support communications interoperability between dissimilar wireless systems in the field at the incident scene. The resource connection, provided by the mobile gateway, will be between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) in need of interoperability using the [insert wireless resource here] patched to the wireless resource of the on-scene agency. The objective is to have an SOP in place for [insert entity or agency here] to have pre-established mobile gateway wireless resources available to external responding on-scene agencies with the need to interoperate during the incident.

2. Technical Background

   A mobile gateway patch between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) will enable access by the disparate wireless resource to our agency's [enter type of connected wireless resource (e.g., radio and talkgroups/channels, phone system, SAT phone) here]. There is a [insert type of connection here] connecting the [insert wireless resource here] to [insert wireless resource here] to support multi-agency, multi-jurisdictional communications during mutual aid incidents.

3. Operational Context

Established mutual aid response protocols between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) will provide the basis for operational activation of the mobile gateway. The following is a hierarchy of projected operations based on priority, with the first operation holding the highest priority:

1. A large-scale emergency incident that requires a multi-agency, multi-jurisdictional response (e.g., a natural disaster such as a hurricane, a terrorist incident involving weapons of mass destruction).
2. Everyday response-level communications to emergency or urgent incidents that require mutual aid response from multiple agencies (e.g., high-speed pursuits crossing jurisdictional boundaries, a large warehouse fire requiring mutual aid response).
3. Special event control activities, generally of a pre-planned nature, involving joint participation of two or more agencies (e.g., a large sporting event such as a college football game, a dignitary visit).
4. Drill, maintenance, and test exercises.

4. Recommended Protocol/Standard

Established mutual aid response protocols between [insert entity or agency here] and the external responding on-scene agency (Federal, State, regional, etc.) will provide the basis for operational activation of the mobile gateway. The following is a hierarchy of projected operations based on priority, with the first operation holding the highest priority:

- Establish National Incident Management System – Depending on the size of the incident, the use of an Incident Command System (ICS) compliant with the National Incident Management System (NIMS) is recommended when using any regional interoperability resource for large-scale multi-agency, multi-jurisdictional incidents.
- Plain Language – All interoperable communications during multi-agency, multi-discipline incidents should be in plain language. Avoid using radio codes, acronyms, and abbreviations as they may cause confusion between agencies. Ensure that all verbal requests for assistance or backup specify the reason for the request.
- Unit Identification – Announce your home agency prior to announcing your unit identifier during interoperable communications situations when utilizing the mobile gateway.
- Encryption – All encrypted radio users must operate in a "clear" mode when a mobile gateway is used, unless otherwise arranged in advance. Never assume that a mobile gateway can manage encryption between systems.
- Monitoring – If ICS is established and it is deemed appropriate, the Incident Commander, or his/her designee, will ensure that each channel or talkgroup connected by the gateway is monitored while in use. In a smaller mutual aid response, the Agency Lead may also require that each channel or talkgroup connected by the gateway be monitored.

## 5. Recommended Protocol Procedure

### Mobile Gateway Request

The agency requesting the use of a cross-patch with the mobile gateway connection for incident or event communications support should provide the following information to the agency supporting the operation:

- Name of the agency and appropriate authorization verification (e.g., name of authorized user, lead responder for this agency, security credentials).
- The type of wireless resource needed (e.g., cell phone to radio, disparate agency radio to local tactical operational radio).
- The responsible party for requesting agency command or the lead relevant to the mutual aid request.
- The talkgroups/channels/wireless resources required to be connected.
- The duration of the patch activation.
- The process for patch audio monitoring and the responsible agent for recording (e.g., dispatch center, Incident Commander, Radio Operator [RADO]).
- The designation or type of patch: "Command and Control" or "Tactical Operational."

### Mobile Gateway Activation

Once agencies agree to cross-patch their wireless resource, the procedures for establishing communications connectivity are:

- Verify that the necessary elements for connectivity are available (e.g., patch cables, connection slots).
- Select the predetermined talkgroups or channels to establish a cross-patch with the disparate wireless resource.
- Verify the system-wide availability of required resources (coordinate among control point dispatchers).
- Provide radio call sign/designator information to connected agencies as necessary.
- Notify the requested unit/agency to the talkgroup or channel availability.
- Notify the responding units to the appropriate talkgroup and have the units switch to the designated shared talkgroup or channel, if required.
- Confirm responding units are operating on the appropriate talkgroup or channel.
- Identify users on the connected talkgroup or channel using their agency name and unit identifier through a roll call when appropriate (users in a secure setting or a mutual aid response may not require dispatcher validation).
- Announce to users at predetermined time intervals, specifically [insert time interval here], that a mobile gateway connection is in place, and interoperable communications procedures are in effect as deemed necessary by the Incident Commander or Agency Lead.
- Monitor the connected talkgroup or channel to address requests as required.
- Monitor the system for problems that may require technician intervention.
- Monitor for system problems that may require a deactivation of the mobile gateway.
- Record the talkgroup(s) or channel(s), if required or where appropriate.
- Monitor designated calling channel where required.

### Mobile Gateway Deactivation

When the gateway connections are no longer required, agencies should follow these deactivation procedures:

- The authorizing agent requests the mobile gateway be deactivated.
- Announcement will be made over connected talkgroups or channels that connections will be deactivated prior to the connection being disabled.
- Prior to mobile gateway deactivation, agencies should ensure that all personnel have returned to their appropriate home talkgroups or channels.
- Agencies may want to conduct a roll call of all affected personnel to confirm they returned to their home systems.
- After deactivation of the mobile gateway, talkgroups or channels should be returned to their normal mode of operations.

### Mobile Gateway Problem ID and Resolution

- Report any problems with the mobile gateway connections to the appropriate point of contact (POC) for that agency.
- A routine mobile gateway test schedule should be established [daily/weekly/monthly] to confirm availability and operational use.
- After action reports should be utilized to help identify potential problems and prospective solutions.

## 6. Management

The cooperating agencies are responsible for the operational management of their system. A governance structure will be established to ensure that legal, operational, technical, training, and funding issues are addressed.

# APPENDIX E–EXISTING WAYNE COUNTY PUBLIC SAFETY RADIO NETWORKS

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# APPENDIX F–WAYNE COUNTY RADIO PLAN

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