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EXECUTIVE SUMMARY

L.R. Kimball respectfully submits this Interoperability Gap Analysis Report and Recommendations for non-public safety to the Southeast Michigan (SEMI) Urban Area Security Initiative (UASI) region.

Pursuant to L.R. Kimball's contract with the SEMI UASI, this report analyzes collected data pertaining to non-public safety agency radio communications systems in the SEMI UASI to identify the types of systems within the region and any interoperability gaps, and provides recommendations to mitigate the interoperability gaps, with approximate costs for the recommendations.

L.R. Kimball developed a written survey for non-public safety agencies to provide information on their radio systems and to identify interoperability gaps and needs experienced by their agencies. While the survey was sent by e-mail to 332 agency representatives, only 52 surveys were returned. L.R. Kimball evaluated all interoperability gaps identified in the responses. In addition, L.R. Kimball downloaded all radio licenses in the region for those station classes typically used by governmental agencies from the Federal Communications Commission (FCC) database. This assisted in identifying call signs and frequencies used by non-public safety agencies in the region.

L.R. Kimball found that there is a very limited relationship, currently, between public safety and non-public safety agencies. Public safety agencies only had lists of non-public safety agencies in each county. Public safety communications officials had difficulty identifying points of contact for non-public safety communications systems. There are, of course, exceptions. Some non-public safety agencies do participate in shared systems with public safety agencies within the region. Dispatch centers typically have relationships with their jurisdiction's public works and other local governmental services and have access to local public works radio systems.

Macomb County public safety services and numerous non-public safety agencies/entities utilize the city of Warren 800 MHz trunked radio system and the Michigan Public Safety Communications System (MPSCS) 800 MHz trunked radio system. Other public services, public works departments and schools operate their own radio systems.

The most frequently cited interoperability gap in Macomb County is between public safety agencies and local public works departments, as these entities have more opportunities to jointly respond to incidents and hazardous conditions.

All Monroe County public safety agencies and some non-public safety agencies are on the Monroe County MPSCS. Monroe County Central Dispatch uses a Raytheon ACU-1000® interoperable gateway to connect fixed bases and control stations on several non-public safety systems. Although many agencies in Monroe County participate in the Monroe County MPSCS, it would be desirable to bring additional agencies onto the system.

In Oakland County, the countywide shared trunked radio system, OakWIN, is solely a public safety communications system that includes hospitals. The OakWIN system uses 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. Numerous non-public safety agencies operate their own land mobile radio (LMR) systems in Oakland County. Except for local public safety dispatch center access

to respective public works channels, there was no reported interoperability between agencies operating their own LMR systems and public safety agencies.

All St. Clair County public safety agencies and some non-public safety agencies are on the St. Clair County MPSCS. All public school districts in the county are on the St. Clair MPSCS and have interoperability with public safety agencies in the county. Several non-public safety agencies operate their own LMR systems in St. Clair County. While St. Clair County borders Canada, there is no interoperability with Canadian authorities.

All Washtenaw County public safety agencies are on the Washtenaw County MPSCS. Numerous non-public safety agencies operate their own LMR systems in Washtenaw County.

The interoperability gaps in Washtenaw County between public safety and non-public safety agencies are primarily caused by disparate radio systems. Although the Washtenaw County 800 MHz backup and the University of Michigan's 800 MHz analog trunked radio system provide backup to public safety agencies on MPSCS, public safety and non-public safety agencies that remain on these systems do not have access to MPSCS. Existing users on these systems should consider migration to MPSCS.

Wayne County is the least consolidated of the six counties, with six shared systems operating in the county. Numerous non-public safety agencies participate in these shared systems, providing interoperability with public safety agencies. All systems are 800 MHz trunked radio systems, using analog and digital technologies. Other non-public safety agencies operate their own LMR systems in Wayne County, with little ability to engage in interoperable communications with public safety agencies.

The need for interoperable communications between non-public safety agencies and public safety dispatch centers and agencies varies significantly among the various disciplines and services.

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

The optimal radio communications technology to support interoperability is the use of shared systems, such as the MPSCS, OakWIN, Downriver Mutual Aid trunked system, Conference of Eastern Wayne trunked system and Western Wayne Mutual Aid trunked system. L.R. Kimball recommends that essential non-public safety agencies be brought onto these shared systems, where possible. Nearly the entire region is served by these trunked radio systems, and public safety agencies are increasingly moving towards two shared systems—MPSCS and OakWIN; as such, the technological foundation exists for employing shared systems as an interoperability solution. L.R. Kimball recommends that this strategy be prioritized for non-public safety agencies.

Conventional shared Very high frequency (VHF) and Ultra high frequency (UHF) channels have traditionally been used by public safety agencies for interoperability, e.g., the Michigan Emergency Public Safety System (MEPSS), Hospital Emergency Radio Network (HERN) channels, and the national mutual aid channels. Typically, non-public safety agencies have not had access to these channels or similar shared channels for interoperability. Within the constraints imposed by the FCC, the national public safety mutual aid VHF (VCALL/VTAC) channels and the UHF (UCALL/UTAC) channels might be programmed in non-public safety agency radios for the limited use of

interoperability with public safety agencies for emergency responses. These channels might be programmed only in supervisory radios. This would permit properly programmed VHF and UHF gateway radios programmed with the national mutual aid channels to interconnect with non-public safety radios.

Fixed and mobile gateways offer one of the primary solutions to providing interoperability between public safety systems and non-public safety systems. 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®. Numerous other gateway devices perform the same function. Public safety within the region uses fixed and mobile gateway devices. In addition to the gateway devices, most dispatch centers in the region have console patch capabilities. Any channel accessible in the console can typically be patched with any other channel.

The last option for providing interoperability with non-public safety agencies is to swap radios. The non-public safety agency can either be provided with a public safety system radio or a radio can be obtained from the non-public safety agency. In some circumstances, this may be the most practical solution. Swapping radios need not necessarily involve exchanging radios at the time of an incident. It may be accomplished by purchasing or obtaining a desktop or portable radio that operates on the non-public safety system and installing it at the dispatch center or mobile command post to be used only when needed.

Currently non-public safety agencies are not involved in interoperability governance at the regional level because there is no representation on the existing SEMI UASI Interoperability Committee. At the local level, agencies using a shared trunked radio system may be represented on local advisory committees.

To the extent that some non-public safety agencies do use shared public safety systems, these agencies are subject to the system rules, in particular those agencies using MPSCS and the Conference of Eastern Wayne system.

For emergency responders—both public safety and non-public safety—to perform effectively in responding to incidents, they must be trained in and practice (exercise) the skills, knowledge and abilities required to carry out their respective roles and responsibilities. With interoperable communications, the equipment must be tested and should actually be used in exercises. To prepare non-public safety agencies to respond effectively to emergencies, training must first be provided in incident management and interoperable communications procedures.

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1.   BACKGROUND

In October 2010, SEMI UASI contracted with L.R. Kimball to conduct an assessment of the existing non-public safety communications systems in the SEMI UASI region and to make recommendations for improving interoperability between public safety agencies and non-public safety agencies.

L.R. Kimball was tasked with researching and documenting information on the radio communications assets used by non-public safety agencies and entities in the region. SEMI UASI provided a list of specific agencies and entities for this task. L.R. Kimball gathered information on each agency based on the required fields in the Department of Homeland Security's (DHS) Communications Asset Survey and Mapping (CASM) database templates.

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2.   METHODOLOGY

At the time of the project initialization meeting, SEMI UASI Interoperability Committee sub-committee members did not have a consensus on how to contact non-public safety agencies throughout the region. The decision was made for L.R. Kimball to work with the counties to determine the best way to solicit data from non-public safety agencies.

L.R. Kimball developed a written survey for non-public safety agencies to provide information on their radio systems and to identify interoperability gaps and needs experienced by their agencies (see Appendix A–SEMI UASI Interoperable Communications Survey Non-public Safety Agencies). County representatives reviewed the survey and provided some contact information for non-public safety agencies. Contact information was also solicited from public safety representatives in focus group meetings and in surveys administered to dispatch centers.

County representatives and public safety communications personnel had difficulty providing this contact information. Using the list of non-public safety agencies provided by the SEMI UASI, L.R. Kimball conducted Internet research and placed telephone calls to agencies to identify points of contact to send the survey form. The survey was subsequently sent by e-mail to 332 agency representatives. Fifty-two surveys were returned, for a return rate of 15.66 percent.

L.R. Kimball evaluated all interoperability gaps identified in the responses.

In addition, L.R. Kimball downloaded all radio licenses in the region for those station classes typically used by governmental agencies from the FCC database. This assisted in identifying call signs and frequencies used by non-public safety agencies in the region.

Once relevant information on the non-public safety radio systems was collected, L.R. Kimball compiled the information and formatted it using the CASM database templates. L.R. Kimball entered the required information into the CASM database.

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3.   FINDINGS AND ANALYSIS

3.1   Existing Relationships

L.R. Kimball found that there is a very limited relationship, currently, between public safety and non-public safety agencies. Public safety agencies only had lists of non-public safety agencies in each county. Public safety communications officials had difficulty identifying points of contact for non-public safety communications systems. There are, of course, exceptions. Some non-public safety agencies do participate in shared systems with public safety agencies within the region. Dispatch centers typically have relationships with their jurisdiction's public works and other local governmental services and have access to local public works radio systems.

Some agencies identified by the SEMI UASI as non-public safety agencies are quasi-public safety in nature, particularly hospitals, private emergency medical services (EMS), and railroad police. For these agencies, relationships do exist and interoperability has generally been achieved. Hospital radio communications are coordinated by the Medical Control Authorities (MCAs), and the Region 2 North and Region 2 South Healthcare Coalitions.

3.2   Macomb County

Macomb County public safety services utilize the city of Warren 800 MHz trunked radio system and the MPSCS 800 MHz trunked radio system.

In addition to law enforcement agencies, fire departments, and fire department-based EMS, the agencies/entities listed below use the MPSCS in Macomb County.

Table 1 – Macomb County MPSCS Users

Agencies/Entities	
Chesterfield Township Department of Public Works (DPW)	New Haven DPW
Harrison Township DPW	Richmond DPW
Macomb County DPW	Richmond/Lennox EMS
Macomb County Health Department	Sterling Heights DPW
Macomb County Health Department – Animal Control	St. Clair Shores DPW
Macomb County Transportation	Universal Ambulance
Macomb Road Commission	Utica DPW
Medstar Ambulance	

Warren DPW, Warren Parks and Recreation, Warren Buildings Department and Warren Engineering Department use the city of Warren 800 MHz trunked radio system.

The public services and DPWs listed below operate their own conventional analog LMR systems in Macomb County.

Table 2 – LMR Systems in Macomb County

Agencies/Entities	
Armada DPW	Mount Clemens DPW
Bruce Township DPW	New Baltimore Local Government
Chesterfield Township DPW	Roseville DPW
Clinton Township DPW	Shelby Township DPW
Eastpointe DPW	Shelby Township Parks
Macomb Township DPW	Washington Township DPW

Eastpointe DPW also has two MPSCS portables. New Baltimore Local Government has two MPSCS radios for liaison with the fire department. Roseville DPW is planning to move to the MPSCS.

Most public works radio systems are accessible from a local dispatch center. Romeo DPW and Fraser DPW reported that they have abandoned their LMR systems in favor of "push-to-talk" cellular technology. No information was found on LMR systems used by Ray Township DPW.

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

Schools listed below have their own radio systems.

Table 3 – Macomb County Schools Radio Systems

Schools	
Armada Schools	Macomb County Intermediate School District
Chesterfield School District w/ L'Anse Creuse School District	Romeo School District
East Detroit School District	Utica Community Schools
L'Anse Creuse School District	Warren Consolidated School District

L.R. Kimball could not locate information regarding radio systems for the New Haven Schools, Richmond Schools, and Mount Clemens School District.

Other non-public safety radio systems identified in Macomb County are the Suburban Mobility Authority for Regional Transportation (SMART), ANR Pipeline (TransCanada Corporation), Consumers Energy and DTE Energy.

The most frequently cited interoperability gap by respondents in Macomb County is between public safety agencies and local DPWs. This is probably because these entities have more day-to-day occasions to respond to incidents and hazardous conditions jointly. There has been a steady migration of public works agencies in the county to the MPSCS. The other large group of non-public safety agencies not using a shared system in Macomb County is the public schools.

3.3   Monroe County

All Monroe County public safety agencies and some non-public safety agencies are on the Monroe County MPSCS.

In addition to law enforcement agencies, fire departments, and fire department-based EMS, the following agencies/entities use the MPSCS in Monroe County:

- City of Monroe DPW
- Lake Erie Transit System
- Monroe County Animal Control
- Monroe County Health Department
- Monroe County Road Commission

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 has a VHF radio on the HERN 155.340 MHz and 155.400 MHz channels. Monroe Community Ambulance, the only EMS in the county, is dispatched by the Huron Valley Ambulance Service in Washtenaw County. Two air ambulance services support Monroe County—the University of Michigan's Survival Flight and the Toledo, Ohio-based Life Flight; both services have MPSCS and HERN capabilities.

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.

Non-public safety agencies that are not on the Monroe County MPSCS or do not have a gateway interconnect with public safety include the agencies/entities listed below.

Table 4 – Agencies without Public Safety Interconnections (Monroe County)

Agencies/Entities	
Airport Community Schools	Mason Consolidated School Board
Bedford Public School Board	Milan Area Schools
Berlin Township Wastewater	Milan City DPW
City of Monroe Government	Monroe Charter Township
Dundee Community School Board	Monroe Public Schools
Ida Public School Board	Promedica

Although many agencies in Monroe County participate in the Monroe County MPSCS, it would be desirable to bring some or all of the agencies identified above onto the system.

L.R. Kimball could not locate information regarding LMR systems for Raisinville Township, Monroe County Child Services, South Monroe County Water District, Summerfield School Board, Summerfield Township, Whiteford Agricultural School Board and Whiteford Township.

3.4   Oakland County

In Oakland County, the countywide shared trunked radio 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' OpenSky time division multiple access (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, including the hospitals within the county, with agencies from surrounding jurisdictions. Talkgroup 63OAKH is permanently patched with the OakWIN Harris Network First® fixed gateway to an identically named MPSCS talkgroup and 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 MSPCS with this talkgroup programmed.

The non-public safety agencies listed below operate their own LMR systems in Oakland County.

Table 5 – LMR Systems in Oakland County

Agencies/Entities		
ANR Pipeline (TransCanada Corporation)	Holly Area School District	Royal Oak City DPW
Auburn Hills City DPW	Huron Valley Schools	Royal Oak School District - Special Education – operated by Durham School Services
Berkley City DPW	Independence Township DPW	Ryder Student Transportation Services
Berkley School District	Keego Harbor DPW	Somerset Collection Mall
Birmingham City DPW – operated by Durham School Services	Lake Orion Community Schools	South Lyon City DPW
Birmingham City School District	Madison District Schools	South Lyon Community Schools
Bloomfield Hills School District	Madison Heights DPW	Southfield City DPW
Bloomfield Township DPW	Novi City DPW	Southfield Public School District – operated by Durham School Services
Brandon School District	Novi Community School District	Troy City DPW
Clarenceville School District	Oak Park City School District	Troy School District – operated by First Student Transportation
Clarkston Community School District	Oak Park Public Works	Walled Lake Consolidated Schools
Clawson City DPW	Oakland Mall	Waterford School District
Clawson Public Schools	Oxford Community Schools	Waterford Township DPW
Commerce Township	Oxford Township DPW – handled by Oakland County	West Bloomfield School District

Agencies/Entities		
Farmington Hills DPW	Pontiac City School District – owned by First Student Transportation	West Bloomfield Township
Farmington Public School District	Robinson Bus	White Lake Township DPW
Ferndale City DPW	Rochester City DPW	Wixom City DPW
Ferndale Public Schools	Rochester Community School District	Wolverine Lake Village DPW
Hazel Park DPW	Rochester Hills DPW	

Except for local public safety dispatch center access to their respective public works channels, there was no reported interoperability between these agencies and public safety agencies.

L.R. Kimball could not locate information regarding LMR systems for Avondale School District, Bloomfield Hills City DPW, Farmington City DPW, Hazel Park City School District, Huntington Woods DPW, Lamphere Public Schools, Pleasant Ridge DPW, SOCRRA (recycling), and SOCWA (water authority for the Oakland County Water Resources Commissioner). While some of these municipalities do have LMR licenses, L.R. Kimball was unable to determine their usage.

3.5   St. Clair County

All St. Clair County public safety agencies and some non-public safety agencies are on the St. Clair County MPSCS.

In addition to law enforcement agencies and fire departments, the agencies/entities listed below use the MPSCS in St. Clair County.

Table 6 – St. Clair County MPSCS Users

Agencies/Entities	
Blue Water Bridge (Michigan Department of Transportation)	St. Clair County Health Department
Canadian National Railway Police	St. Clair County Regional Educational Service Agency
Lakeport State Park (Michigan Department of Natural Resources)	St. Clair County Road Commission
Medstar Ambulance	St. Clair County Transportation
Mercy Hospital	St. Clair Courts
Michigan Department of Natural Resources – Southfield	St. John River District Hospital (East China Township)
Port Huron Hospital	Tri Hospital EMS
Region 2 North Healthcare Coalition	U.S. Border Patrol

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 hospitals have a VHF radio on the HERN 155.340 MHz and 155.400 MHz channels.

Significantly, all public school districts in the county are on the St. Clair MPSCS and have interoperability with public safety agencies in the county.

Non-public safety agencies that are not on the shared St. Clair County MPSCS include the agencies/entities listed below.

Table 7 – Agencies without Access to MPSCS (St. Clair County)

Agencies/Entities	
Algonac DPW	DTE Energy-Gas
Algonac Water Department	Port Huron Public Works
Blue Water Area Transportation Commission	Port Huron Utilities
DTE Energy-Electric	SEMCO Energy-Gas

The city of Port Huron dispatch center has access to the city's public works radio system. The other listed agencies currently do not have interoperability with public safety. St. Clair County borders Canada, with bridges and a rail tunnel to and from Canada. There are communications needs with the U.S. Coast Guard. Currently, there is no interoperability with Canadian authorities.

3.6   Washtenaw County

All Washtenaw County public safety agencies are on the Washtenaw County MPSCS. All hospitals and the American Red Cross are also on MPSCS. The hospitals have MPSCS radios provided by the Region 2 South Healthcare Coalition.

The non-public safety agencies listed below operate their own LMR systems in Washtenaw County.

Table 8 – LMR Systems in Washtenaw County

Agencies/Entities		
Ann Arbor Public Schools	Manchester Village DPW	University of Michigan Plant Operations - Ann Arbor Campus
Ann Arbor Public Services	Milan City DPW	University of Michigan Transportation - Ann Arbor
Ann Arbor Transportation Authority	Milan Public Schools	University of Michigan Utilities & Plant Engineering - Ann Arbor
Augusta Township DPW	Pittsfield Township Utilities	VA Medical Center Ann Arbor
Chelsea City DPW	Robinson Bus	Washtenaw County Government Services
Chelsea Public Schools	Saline City DPW	Washtenaw County Public Health Department
Dexter Public Schools	Saline Public Schools	Washtenaw Intermediate School District
Dexter Village DPS	Scio Township Utilities	Whitmore Lake Public Schools
Eastern Michigan University – Non-public Safety	Superior Township Utilities	Willow Run Schools
Lincoln Consolidated Schools	University of Michigan Health System and	Ypsilanti City Public Works

Agencies/Entities		
	Hospital	
Manchester Public Schools	University of Michigan Hospital Security	Ypsilanti Community Utilities Authority (YCUA)
	University of Michigan Housing Security	

Ann Arbor Public Schools, Ann Arbor Public Services and Washtenaw County Government Services are on the old Ann Arbor-Washtenaw County analog trunked system.   This old single site system provides service to all Ann Arbor city services, the Washtenaw County Road Commission, the Pittsfield Township Utilities Department and Saline DPW. This system serves as backup to the Washtenaw County MPSCS for public safety agencies.

L.R. Kimball could not locate information regarding LMR systems for the Ann Arbor Airport, Ann Arbor Railroad, Salvation Army - Washtenaw County, Clinton Schools, Humane Society, or the Forest Health Medical Center.

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 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 University of Michigan has an 800 MHz Motorola SmartNet analog trunked radio system that provides service for the University's Department of Public Safety, Plant Operations and other campus support services. This system also serves as backup for all MPSCS public safety agencies in the county. This provides interoperability between Washtenaw County public safety agencies and the University.

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

3.7   Wayne County

Currently, Wayne County is the least consolidated of the six counties with respect to shared radio systems. There are six shared systems in the county: Detroit MPSCS; Conference of Eastern Wayne (Grosse Pointe area); Western Wayne Mutual Aid; Downriver Mutual Aid; Wayne County MPSCS; and MPSCS. Several municipalities contract directly with MPSCS for service. The city of Livonia is transitioning from a shared EDACS trunked radio system to MPSCS. The Metropolitan Airport Authority maintains its own 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 analog and digital technologies.

All city of Detroit public services, except the Department of Transportation (DOT), are on the Detroit MPSCS sub-system, also referred to as Zone 7 on the MPSCS. As a result, public works in Detroit have interoperability with

public safety agencies. The City's public transit system, operated by the Detroit DOT, maintains its own Logic Trunked Radio (LTR) radio system. The Michigan DOT, Michigan State Police, and the American Red Cross are also on the MPSCS.

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

Wayne County's MPSCS sub-system includes all county service agencies, including the Department of Public Health.

In the Downriver and Western Wayne areas, non-public safety agencies have not typically used the shared public safety systems.

The Detroit City Schools have contracted out their school transportation services. These buses still use the City school transportation radio system, but do not have interoperability with public safety.

Within the county, hospitals are either part of the Health Emergency Medical Services, Inc. (HEMS) Medical Control Authority (MCA) or the Detroit/East MCA. These hospitals all have MPSCS radios provided by the Region 2 South Healthcare Coalition. In addition, some hospitals use MPSCS for ambulance-to-hospital patient care coordination. The hospitals have VHF radios on the HERN 155.340 MHz and 155.400 MHz channels. Most hospitals also maintain LMR systems for internal use. FCC call sign and frequencies used by these institutions have been identified and are included in Appendix B–SEMI UASI Region Non-public Safety LMR Systems.

Outside of the city of Detroit, Wayne County's local public works agencies maintain their own radio systems, with the only interoperability with public safety being local dispatch center access to their radios systems.

The electric and natural gas companies of Consumer Energy and DTE Energy both have their own wide area radio systems. Consumer Energy uses Harris' EDACS technology and DTE Energy uses LTR technology.

All school districts outside the city of Detroit have their own radio systems. With the exception of the Garden City School District, which has a UHF LTR trunked system, all are VHF and UHF conventional systems.

The non-public safety agencies listed below operate their own LMR systems in Wayne County.

Table 9 – LMR Systems in Wayne County

Agencies/Entities		
Allen Park DPW	Hamtramck DPW	Romulus Schools
Allen Park Schools	Highland Park City DPW	Sevestal Fire Department (Security Frequency)
Canton DPW	Huron Schools	South Redford Schools
City of Wayne DPW	Inkster City DPW	Southgate City DPW
Clarenceville Schools	Inkster Schools	Southgate Community Schools
Consumers Energy (800 MHz Statewide	Livonia Schools	Taylor City DPW

Agencies/Entities		
EDACS trunked)		
Crestwood Schools	Melvindale - North Allen Park Schools	Taylor Schools
Dearborn City DPW	Melvindale City DPW	Trenton City DPW
Dearborn Heights City DPW	Norfolk Southern Railroad	Trenton Schools
Dearborn Radio Emergency Team	Northville City DPW	University of Michigan Dearborn Utilities & Plant Engineering
Dearborn Schools	Northville Schools (Security)	Van Buren Public Schools
Detroit Department of Transportation	Plymouth City DPW	Wayne Community Schools
Detroit International Bridge Company	Plymouth Township DPW	Wayne County Airport Authority (Metropolitan Airport 800 MHz trunked system)
Detroit Public Schools	Plymouth-Canton Schools	Wayne County Community College District (Security)
DTE Energy (UHF LTR trunked system)	Redford Township DPW	Wayne-Westland Schools
Garden City Schools	Redford Union Schools	Westwood Schools
Gibraltar Schools	Riverview City DPW	Woodhaven-Brownstown Schools
Grosse Ile Schools	Riverview Schools	Wyandotte City DPW
	Romulus City DPW	

L.R. Kimball could not locate information regarding LMR systems for the non-public safety agencies/entities listed below.

Table 10 – Agencies without LMR Systems (Wayne County)

Agencies/Entities		
Behavioral Centers of America – Stonecrest Center	Lincoln Park DPW	Safeway Transportation
Detroit City Airport	Lincoln Park Schools	Select Specialty Hospital Grosse Pointe
Ecorse Schools	Lingual Translation Services	Select Specialty Hospital NW Detroit
Flat Rock Schools	Marygrove College	St. Mary Mercy Hospital -Livonia
Greyhound	Oakwood Annapolis Hospital	Triumph Hospital Detroit
Grosse Pointe Schools	Oakwood Health Care Center Canton	University of Detroit - Mercy
Hamtramck Schools	Oakwood Southshore Medical Center	Vibra Hospital Southeast Michigan
Harper Woods Schools	Rehabilitation Institute of Michigan	Wayne County Regional Educational Service Agency (RESA)
Highland Park Schools	River Rouge Schools	

Based on survey responses, L.R. Kimball determined the Salvation Army – Detroit, Select Specialty Hospital Downriver, and Wyandotte Schools do not maintain LMR systems.

As with other counties, local public safety dispatch centers typically have access to their jurisdiction's public works radio system. Those agencies listed above that maintain their own LRM systems have little, if any, ability to engage in interoperable communications with public safety agencies.

3.8   Interoperability Requirements

The need for interoperable communications between non-public safety agencies and public safety dispatch centers and agencies varies significantly among the various disciplines and services.

Public works agencies can include different local services depending on the jurisdiction—roads, water, sewer, maintenance, etc. In larger jurisdictions, these services may have their own 24/7 dispatch operations. In smaller jurisdictions, these services may rely on the local public safety dispatch center for dispatching after normal business hours. Nearly all dispatch centers have some access to their respective jurisdiction's public works departments. If police or fire services need assistance from public works agencies, the dispatch center will typically relay the request and not use a console patch to allow direct communications.

Interoperable communications between public works and public safety is typically lacking in field incident operations. In major incidents where incident commanders require more direct communications with public works and where public works agencies may be involved in unified command operations, relaying through a dispatch center may be inadequate to support incident communications. In such cases, having public works radio channels available in radios installed in mobile communications vehicles and/or gateway-connected radios is advantageous.

Another interoperable communications need for public works agencies is the ability to communicate with public works departments in neighboring jurisdictions. Public works, like public safety, often work with their neighbors. In some circumstances, they may be called upon to render mutual aid. In these circumstances, the need for interoperable communications may be no different from public safety agencies. Having the ability to interconnect disparate public works radio systems for incident management is beneficial.

Public schools typically operate radio systems for internal maintenance use and school bus fleets. Emergency management plans often include the use of school buses for transportation in major emergencies, such as evacuations. To support such operations, the ability to communicate directly with school buses to coordinate mission critical activities is desirable. Again, it is advantageous to have access to public schools' radio systems at dispatch centers and in radios installed in mobile communications vehicles and gateway-connected radios. The same interoperability needs exist with public transportation systems.

Assistance from utilities is frequently required for incident management to mitigate hazards. Utilities may also be the source of a hazardous incident. In such circumstances, it may be valuable to have direct communications from Incident Command to the utilities to effectively coordinate incident management activities.

Railroads are a unique entity, using VHF High band frequencies (161-162 MHz). From the survey responses, L.R. Kimball learned that railroads in the area often have track usage rights on other carriers' lines. This can cause confusion when notifying the right-of-way entity as the names on the engines/cars may differ from the known track owner. When operating on other carriers' tracks, engineers need to use the track owner's radio channels. Amtrak uses the radio system of the railroad whose track is being used by the Amtrak train.

Survey respondents indicated that they prefer to work through their railroad police when interfacing with public safety in emergencies and disasters, rather than routing communications through train and work crews.

Railroads are often the source of hazardous material incidents. In such cases, having the railroad's radio channels available in radios installed in mobile communications vehicles and gateway connected radios is preferable.

Canadian National (CNN) has radios on the MPSCS in St. Clair County.

Major railroads in the SEMI UASI region use the radio frequencies listed below, which were identified from FCC licenses.

Table 11 – Railroad Radio Frequencies

Frequencies		
CSX Railroad	Grand Trunk Western (Subsidiary of CNN)	Norfolk Southern
161.370 MHz - Road	161.220 MHz - Road	161.220 MHz - Road
161.160 MHz	161.430 MHz	161.430 MHz
161.220 MHz	161.490 MHz	161.490 MHz
161.565 MHz	161.550 MHz	161.550 MHz
161.280 MHz	161.025 MHz	161.025 MHz
161.265 MHz	161.535 MHz	
	161.040 MHz - Police	

The Southeast Michigan American Red Cross has talkgroups on the MPSCS and will soon have radio coverage capabilities throughout the entire region. While this provides the American Red Cross access to statewide event channels for interoperability in emergencies and disasters, it may also be beneficial to have the Red Cross channels available in local MPSCS radios for interoperability.

3.9   Non-public Safety Radio Systems

L.R. Kimball compiled information about the various non-public safety radios system and included this data in Appendix B. These systems are listed by county and are primarily the agencies provided by the SEMI UASI to be surveyed as part of this project. For agencies that responded to the survey, L.R. Kimball entered provided information into CASM. For agencies that did not respond, L.R. Kimball researched FCC license data to identify the frequency band(s) used, FCC call sign, and frequencies. This information does not indicate whether the systems are analog or digital or whether wideband or narrowband with certainty. Based on the emission designators on the licenses, it appears that all listed conventional systems are analog. Likewise, unless the information was provided by the agency, the Continuous Tone-Coded Squelch System (CTCSS) or Digital Coded Squelch (DCS) system squelch controls used are not known. The data, nevertheless, is helpful in providing an overview of non-public radio systems in the SEMI UASI region.

Prior to programming any of the listed non-public safety agency frequencies in public safety radios to support interoperability requirements, permission must be obtained from the licensee. At that time, information about channel usage should be confirmed, and frequency emission (wideband/narrowband) and any CTCSS/DCS squelch controls determined.

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4. RECOMMENDATIONS

L.R. Kimball's recommendations address the key elements of interoperable communications—technology, governance, policies/procedures, and training/exercises. Non-public safety agencies have varying needs for interoperability and face different constraints in meeting their respective interoperability needs. For these reasons, L.R. Kimball provides a variety of technological solutions that can be used to achieve the goals of interoperable communications.

4.1 Technology

4.1.1 Shared Systems

The optimal radio communications technology to support interoperability is the use of shared systems, such as the MPSCS, OakWIN, Downriver Mutual Aid trunked system, Conference of Eastern Wayne trunked system and Western Wayne Mutual Aid trunked system. L.R. Kimball recommends that essential non-public safety agencies be brought onto these shared systems, where possible.

Nearly the entire region is served by these trunked radio systems, and public safety agencies are increasingly moving towards two shared systems—MPSCS and OakWIN; as such, the technological foundation exists for employing shared systems as an interoperability solution.

L.R. Kimball recommends that this strategy be prioritized for non-public safety agencies. Governmental agencies and those with the most frequent day-to-day needs for interoperability are the most likely candidates for inclusion in these shared systems. Many of these agencies—public works and municipal utilities, public schools, and public transportation--already use these shared systems. Where these agencies are on the same interoperable shared system, the system(s) should be structured with shared talkgroups to provide sufficient hailing and shared tactical channels to support incident management. MPSCS has largely met this need through the implementation of the Event Channels that can be activated on an "as needed" basis for users in any area of the state.

There are several constraints in bringing non-public safety agencies onto these systems. One is the decreasing reliance on LMR for agency communications. Small agencies particularly find that cellular phones and "push-to-talk" features offered by some carriers meet their internal communications needs. This avoids the need to carry both a cell phone and a radio, allows more detailed conversations, and allows agencies to avoid the costs of an LMR system and subscriber equipment.

The most common reason for non-public safety agencies not participating in shared systems when allowed is the cost of higher tier mobiles and portables.

Another consideration when adding users to any shared system is system capacity. Assessing system capacity is beyond the scope of this project, but before adding a substantial numbers of new users, system capacity must be examined. This constraint will be mitigated in the future as 700 MHz frequencies become available and TDMA P25 Phase 2 technology is implemented, which will greatly increase the available frequencies for these shared systems and nearly double frequency capacity.

Extending shared system access to non-public safety agencies does not necessarily require equipping each non-public safety radio user with a radio on the shared trunked radio system. Providing the dispatch center of a non-public safety agency with a control station on the shared trunked system may be an acceptable solution. This is essentially the approach being taken within the region to achieve interoperability with hospitals. The hospitals have their individual conventional systems to meet their internal communications needs—maintenance, security and hospital staff. The hospitals maintain interoperable radios in their emergency departments for ambulance-to-hospital patient care and mass casualty and disaster regional coordination. This approach is particularly appropriate to any facility-based non-public safety agency. It may also be the best solution for large non-public safety agencies that cannot participate in a shared system with public safety. For example, large utility companies serving multi-county areas are not likely to join the existing shared systems. Putting 800 MHz trunked control stations in their command centers may be the most appropriate solution for interoperability.

4.1.2 Shared Channels

Conventional shared VHF and UHF channels have traditionally been used by public safety agencies for interoperability, e.g., the MEPSS, HERN channels, and the national mutual aid channels. Typically, non-public safety agencies have not had access to these channels or similar shared channels for interoperability.

Within the constraints imposed by the FCC, the national public safety mutual aid VHF (VCALL/VTAC) channels and the UHF (UCALL/UTAC) channels might be programmed in non-public safety agency radios for the limited use of interoperability with public safety agencies for emergency responses. These channels might be programmed only in supervisory radios. This would permit properly programmed VHF and UHF gateway radios programmed with the national mutual aid channels to interconnect with non-public safety radios.

If this solution is chosen by the SEMI UASI as an acceptable approach, L.R. Kimball recommends that the SEMI UASI Interoperable Communications Committee, on a case-by-case basis and upon request of a public safety agency, grant permission to non-public safety agencies to use these channels. Permission to access these VHF/UHF interoperability channels should only be granted to a non-public safety agency when the application is to provide assistance and support to the public safety community in completing their mission.

Non-traditional responders need to be integrated into incident management systems to operate effectively. As such, local public safety entities may, through inter-local agreements, memoranda of understanding or other formalized contractual means, extend their use of these interoperability frequency resources to organizations with established relationships to facilitate emergency operations. Such organizations might include Radio Amateur Civil Emergency Services (RACES) programs ,which are official units of and under the direct oversight of the governmental entity; American Radio Relay League (ARRL)-sanctioned Amateur Radio Emergency Services (ARES) programs, when acting in cooperation with and express approval of the governmental entity; Radio Emergency Associated Citizen's Teams (REACT) groups, when acting in cooperation with and express approval of the governmental entity; locally organized search and rescue groups, when acting in cooperation with and the express approval of the governmental entity; and disaster relief organizations, such as, but not limited to, the American Red Cross and Salvation Army Disaster Relief.

In all cases involving use by non-traditional responders, the governmental entity served must be responsible for proper operation and control of communications equipment at all times, and should take measures to ensure operations abide by all applicable FCC rules and regulations. Non-traditional responders must be required to comply with all FCC type acceptance requirements. Use of modified frequency agile VHF and/ or UHF amateur radio transceivers should not be authorized.

4.1.3   Gateways

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®. Numerous other gateway devices perform the same function. Public safety within the region uses fixed and mobile gateway devices. In addition to the gateway devices, most dispatch centers in the region have console patch capabilities. Any channel accessible in the console can typically be patched with any other channel.

Fixed and mobile gateways offer one of the primary solutions to providing interoperability between public safety systems and non-public safety systems.

The fixed gateway at Monroe County Central Dispatch is a notable use of this technology. The center uses an 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'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 many non-public agencies within the county. Each individual public safety answering point (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. When interconnecting non-public safety agencies with any public safety system channel, 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 – MPSCS Audio Patch and Gateway Interoperability Policy). Establishing a gateway policy for each mobile gateway and console patch should be considered. DHS developed templates for use in writing such policies. These can be found at the following Website: http://www.safecomprogram.gov/SAFECOM/library/interoperabilitybasics/ .

4.1.3.1 Proprietary Technology

One technological feature that needs to be considered when contemplating the implementation of a gateway solution to interconnect non-public safety agencies with public safety agencies is that some non-public safety agencies use proprietary technologies. These proprietary technologies require the use of subscriber radios specific to that

particular technology. L.R. Kimball notes that a number of non-public safety system use LTR systems, e.g. Detroit Public Schools, DTE, and Garden City School. Consumers Energy uses a Harris' EDACS system. Similarly, proprietary digital technologies, such as Motorola's MOTOTRBO® TDMA digital system and Kenwood's Nexedge® frequency division multiple access (FDMA) digital system are becoming increasingly popular with non-public safety services. When considering implementing a gateway solution, subscriber radios that use these proprietary technologies may have to be included.

4.1.4 Swapping Radios and Caches

The last option for providing interoperability with non-public safety agencies is to swap radios. The non-public safety agency can either be provided with a public safety system radio or a radio can be obtained from the non-public safety agency. In some circumstances, this may be the most practical solution. Swapping radios need not necessarily involve exchanging radios at the time of an incident. It may be accomplished by purchasing or obtaining a desktop or portable radio that operates on the non-public safety system and installing it at the dispatch center or mobile command post to be used only when needed. Direct user-to-user communication is not always necessary to coordinate effective incident responses. Without the use of a gateway, it may be necessary to relay communications through the dispatch center or incident command post, but this may be sufficient.

This solution can also be implemented by programming a non-public safety agency's radio frequencies into multi-channel desktop radios, mobiles and portables. This requires only the approval of the non-public safety agency and the only cost is the programming of the radio(s).

L.R. Kimball recommends that public safety dispatch centers and agencies operating mobile communications vehicles (mobile command posts) obtain permission from respective local non-public safety agencies to program radios at the dispatch center and in mobile communications vehicles with these agencies' radio channels to communicate for incident management purposes. These agencies should include school districts, transit systems, railroad police, and utilities. If non-public safety agencies use proprietary technologies, such as the major utility companies, this may require obtaining radios capable of using the proprietary technology.

There are radio caches that can be deployed within the SEMI UASI region when required to provide interoperability with non-public safety agencies.

4.1.5 Cost Estimates

4.1.5.1 Shared System Participation

Assuming capacity exists to add non-public safety users to these systems and there is a willingness to add the agencies, the most likely candidates to participate as users are the governmental public works agencies, public transportation and school transportation systems.

The cost of adding users is primarily the cost of subscriber equipment—mobiles, portables and control stations. Because the county MPSCS sub-systems and the OakWIN system are new, the cost of subscriber equipment to add new users to these systems should be current and well understood by the various county system administrators. Because of the need for trunked radios to have the capacity to support all interoperable channels, subscriber

equipment must have sufficient capacity to program these channels. This typically precludes purchasing low tier radios with only 48 channels. L.R. Kimball learned that in several instances agencies had purchased radios with insufficient channel capacity to program all interoperable channels, thus limiting their usefulness and complicating effective incident communications.

L.R. Kimball estimated cost ranges of subscriber units to operate on shared trunked radio systems in the SEMI UASI region are listed below.

Table 12 – Subscriber Unit Cost Estimates

Unit	Cost Estimate
Mobiles	$3,500 to $4,500
Portables	$2,500 to $3,000
Control Stations	$4,000 to $5,700

These costs are based on typical models purchased; actual costs may vary based on user-defined features.

L.R. Kimball understands that most of the county MPSCS sub-systems in the SEMI UASI are newly constructed and user fees are not currently imposed under MPSCS's local credit policy, which waives user fees for a period time for jurisdictions bringing frequencies and towers to the system. Some agencies must contract directly with MPSCS for use of the system and already pay user fees. It is expected that eventually all users will have to pay MPSCS for system usage. The MPSCS user fees have been included in Appendix D–MPSCS Fee Structure.

4.1.5.2 Gateway Solution

The cost of implementing an interoperable gateway solution can vary widely depending on the complexity and capacity of the gateway device, the number and cost of the fixed base or mobiles radios to be interconnected and any necessary antenna systems to support the radios. Accordingly, the estimates below are rough order of magnitude. For these cost estimates, L.R. Kimball assumed two mobile-type radios for an 800 MHz trunked system, UHF band and VHF high band. No estimates for antennas systems have been provided. In most cases, no tower mounted antenna would be necessary to access local radio systems for fixed gateways. If installed in a mobile communications vehicle, the antenna system would consist of roof-mounted mobile antennas.

Table 13 – Gateway Cost Estimates

Equipment	Number	Unit Cost	Sub-total Cost
Gateway Device	1	$8,000 to $22,500	$8,000 to $22,500
800 MHz Radios	2	$4,000	$8,000
VHF Radios	2	$3,000	$6,000
UHF Radios	2	$3,000	$6,000
Antenna System	Variable		
		Total	$28,000 to $42,500

These cost estimates are based on typical public safety-grade equipment that L.R. Kimball would recommend. Installation charges will vary depending on whether the gateway is fixed or mobile and whether there is existing equipment that might be used. These cost estimates are presented to provide a rough estimate of the cost of a gateway solution. Radios that can operate on multiple technologies require additional software and may be more expensive. For example, it may be desirable in some areas that the 800 MHz radios operate on the MPSCS P25, Harris OpenSky®, and Harris EDACS® systems. A radio with this technology agility will be more expensive because of the additional software required. The 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 the following Website: http://www.npstc.org/documents/Audio%20Gateway%20Handbook_320_Final.pdf .

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

4.2   Governance

Currently non-public safety agencies are not involved in interoperability governance at the regional level because there is no representation on the existing SEMI UASI Interoperability Committee. At the local level, agencies using a shared trunked radio system may be represented on local advisory committees.

While it is still in draft format, Monroe County has the only local Tactical Interoperable Communication Plan (TICP) in the region. The Interoperability Governing Body included the Director of the Monroe County MCA and the TICP Planning Committee lists non-public safety disciplines as having representation.

If non-public safety agencies are to participate in interoperability planning, it is necessary to include them in some way in the governance process. L.R. Kimball has recommended non-voting membership for representatives of the various major non-public safety services on the SEMI UASI Interoperable Communications Committee.

4.3   Policies and Procedures

To the extent that some non-public safety agencies do use shared public safety systems, these agencies are subject to the system rules, in particular those agencies using MPSCS and the Conference of Eastern Wayne system. However, in general, non-public safety agencies do not have policies and procedures that govern interoperability with public safety.

4.4   Training and Exercises

DHS has recognized that interoperability is not solely a technology problem that can be solved with the "right" equipment or the "right" communications system. Interoperability is a multi-dimensional issue, as graphically depicted by the DHS Interoperability Continuum, figure 1 below. This framework visually depicts the core facets of interoperability that must be addressed to ensure successful and sustained interoperability improvements.
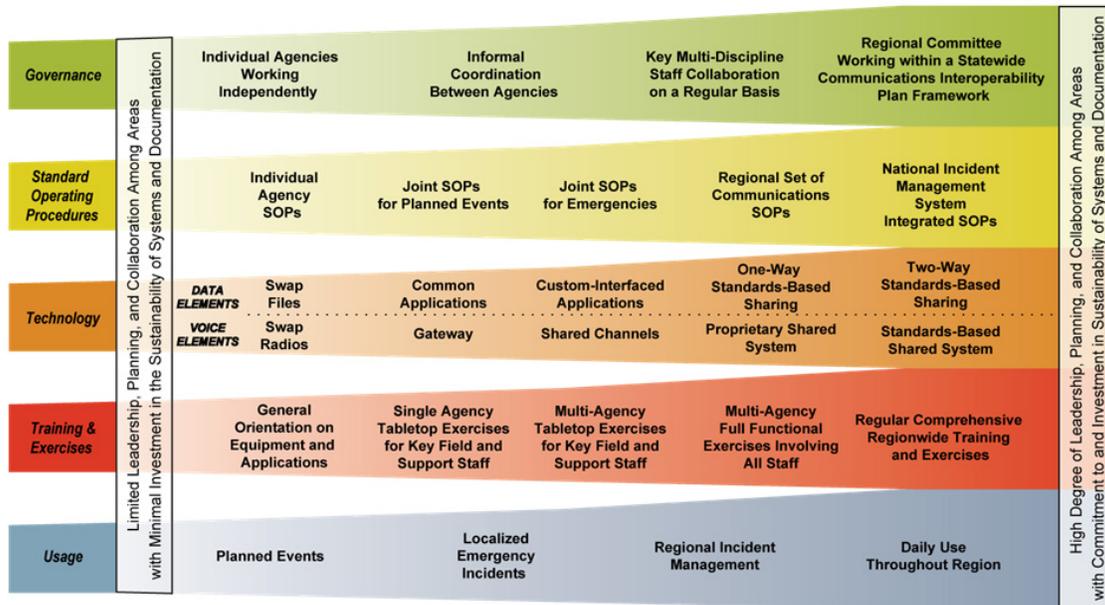
Figure 1 – SAFECOM Interoperability Continuum

The Interoperability Continuum facilitates discussions between emergency responders and policymakers as they collaborate to frame key initiatives for short- and long-term interoperability efforts. Additionally, the Interoperability Continuum helps emergency response practitioners and policymakers evaluate the maturity of their agencies' and regions' interoperable communications capabilities. 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.

4.4.1 Non-public Safety Agency Incident Response

The Incident Command System (ICS), as a part of the National Incident Management System (NIMS), is a standard, on-scene, all-hazards incident management concept and shall be used during all incidents in the state of Michigan.

Figure 2 illustrates a basic ICS organizational structure that might be used in response to an incident requiring a multi-agency, multi-disciplinary, and/or multi-jurisdictional response.
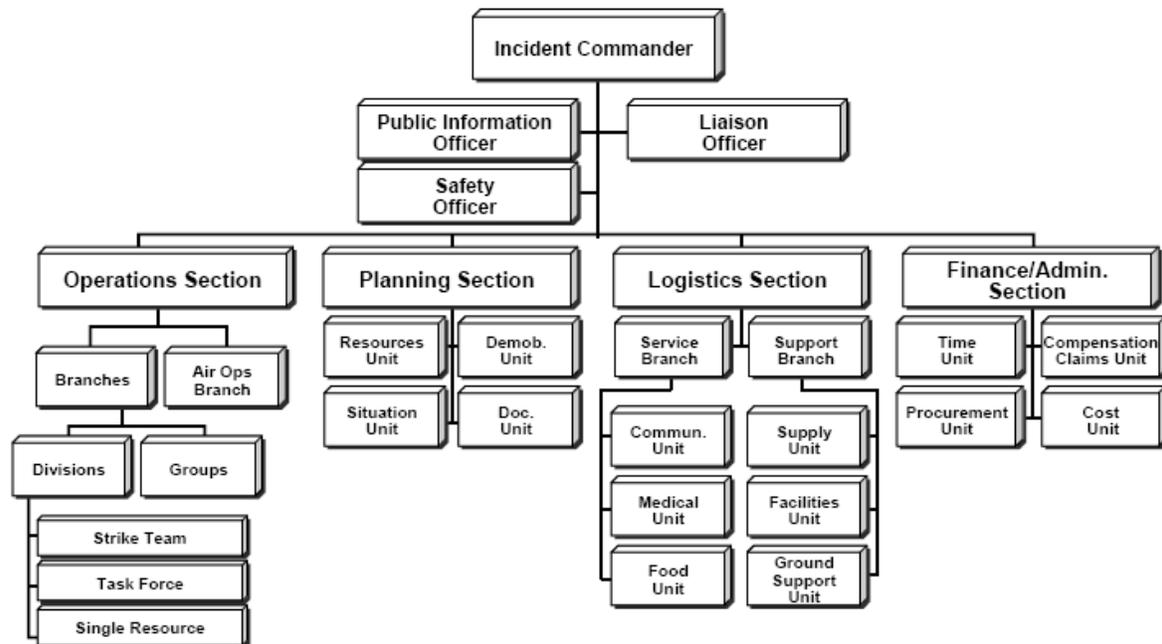
Figure 2 – Typical ICS Organizational Structure

Non-public safety agencies may be called upon to perform a number of functions within the ICS framework, including participation in planning, logistics support, and even operations when mitigating hazards involving the agency's facilities and resources. Public transit and school transportation systems may be called upon to plan and assist in evacuating persons from affected areas. Railroads, as the possible source of a hazardous materials incident, may need to be involved in both planning and operations. Non-governmental EMS will typically be involved in operations. Depending on the nature of the incidents, hospitals may be engaged as part of a Medical Branch under Operations, part of the Planning Section or assisting in the provision of medical services as a part of a Medical Unit under the Logistic Section. Public works may be activated as a branch of the Operations Section and may be involved in planning and logistics. Utilities may be involved in incident management in roles similar to public works. Like railroads, utilities can be the source of a hazardous incident and may be involved in operations to mitigate the hazard. Disaster relief agencies, such as the America Red Cross, will typically be part of the Logistics Section, but may also help in planning. These critical roles and responsibilities of non-public agencies require effective communications with public safety agencies. The ability to communicate directly with Incident Command, section leaders, and branch leaders may be critical to the success of the mission.

4.4.2 Non-public Safety Agency Training and Exercises

4.4.2.1 Training

For emergency responders—both public safety and non-public safety—to perform effectively in responding to incidents, they must be trained in and practice (exercise) the skills, knowledge and abilities required to carry out their respective roles and responsibilities. With interoperable communications, the equipment must be tested and should actually be used in exercises.

To prepare non-public safety agencies to respond effectively to emergencies, training must first be provided in incident management and interoperable communications procedures.

Non-public safety personnel are composed of a multitude of disciplines. At the local level, there are appointed and elected public officials and those who work in DPWs (highways, water, sewer, etc.). There are those involved in healthcare, including nurses, doctors, and administrators. There are school personnel, including transportation, educators, and administrators. There are those involved in higher education institutions, which could include security, transportation (larger facilities) and administrators. Additionally, there are public sector entities, such as utilities, transportation (public services and private services), railroads, and pipelines, and quasi-public sector entities, such as the American Red Cross and Salvation Army.

Due to the broad spectrum of this non-public safety group, challenges exist in communications with them. Some have basic familiarity with radio communications, while others have no experience. Many will not have experience dealing with stressful emergency or disaster situations. Although the non-public safety role may be limited, training will be a necessity for most, if not all, personnel. Computerized training may be practical due to the multiple disciplines involved and the vast range of knowledge and abilities that may be encountered.

County emergency management agencies may need to develop communications training programs to be presented to supervisory and other appropriate personnel from non-public safety agencies. At a minimum, basic radio instruction will be needed for non-public safety personnel. Due to the various disciplines involved, training will need to be focused somewhat towards the particular discipline. This basic radio instruction can be short and to the point. Providing laminated cards with communications instructions for non-public safety personnel to be used in incident responses may be helpful.

Consideration must also be given to providing NIMS training for personnel that may be involved in incident communications with an emergency operations center (EOC) or Incident Command. Federal Emergency Management Agency (FEMA) courses are available on-line to inexpensively provide basic instruction in incident management. NIMS Introduction, IS-700a, would be a good starting point. ICS training is also available through FEMA. Healthcare/Hospital is covered in IS-100.HCb. Schools are covered in IS-100.SCa. Higher Education is covered in IS-100.HE. Public Works is covered in IS100.PWb. For security or campus police, there is a law enforcement version of the ICS training, IS-100.LEb. Personnel can enroll and take these courses through the following Website: http://training.fema.gov/IS/ .

4.4.2.2 Exercises

An exercise is a focused practice activity that places the participants in a simulated situation requiring them to function in a capacity that would be expected in a real event. The 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.

A comprehensive exercise program contains five areas:

> Orientation seminar – The orientation seminar is an overview or introduction to interoperable communications systems and procedures. The purpose is to familiarize participants with roles, plans, procedures, and/or equipment. It can also be used to resolve questions of coordination and assignment of responsibilities.

> Drill – 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 an interoperable shared channel. With a drill, there is no attempt to coordinate organizations or fully activate EOCs. Its role is to practice and perfect one small part of the response plan and help prepare for more extensive exercises. The effectiveness of a drill is its focus on a single, relatively limited portion of the overall emergency management system.   Tabletop exercise – 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.

> Functional exercise – 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.

> Full-scale exercise - 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 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.

These different exercises can be structured to test interoperable communications capabilities between public safety and non-public safety agencies.

To advance training and exercises, DHS developed a methodology for communications-focused, multi-agency tabletop exercises, which is described in *Communications-Specific Tabletop Exercise Methodology*. This is a guide for conducting tabletop exercise that will lead to the identification of communications gaps and improvements to address those gaps. This publication 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 and concepts, resources, and

interoperable capabilities. This may help the SEMI UASI identify interoperability capabilities and gaps in existing processes. The document can be found at the following Website:
http://www.safecomprogram.gov/SAFECOM/library/interoperabilitybasics/

The SEMI UASI can use the DHS exercise guidelines to develop tabletops involving non-public safety agencies to be conducted at the local and county level. These would most appropriately be conducted by emergency management officials, but the exercises could be designed by SEMI UASI Interoperable Communications Committee members.

The cost of orientation seminars, drills, and tabletop exercises can vary from inexpensive, locally-developed training programs to contracted tabletop exercises.

L.R. Kimball recommends the SEMI UASI ICC execute a functional training exercise, designed to validate the information and procedures in the Regional TICP developed in previous phases of this project. A functional exercise (FE), 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. An exercise of this caliber 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. An FE 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 FE 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 and 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 include exercise design, evaluation, AAR, gap analysis report, and location, meals and related expenses during the exercise itself.

For a comprehensive approach, using the objectives described above, a budgetary estimate is approximately $40,000.00 to $50,000.

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APPENDIX A – SEMI UASI INTEROPERABLE COMMUNICATIONS SURVEY FOR NON-PUBLIC SAFETY AGENCIES

Appendix A can be found on the following page.

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APPENDIX B – SEMI UASI REGION NON-PUBLIC SAFETY LMR SYSTEMS

Appendix B can be found on the following page.

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APPENDIX C – MPSCS AUDIO PATCH AND GATEWAY INTEROPERABILITY POLICY

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APPENDIX D – MPSCS FEE STRUCTURE

Appendix D can be found on the following page.

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