

ALMR

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WHAT IS A LAND MOBILE RADIO SYSTEM?

It is the two-way radio system in use today by first responders and public safety officials for instant, effective, and private communications during everyday operation, and also provides the efficiency, security and flexibility required during emergencies for communications on demand and in real time.

WHAT IS THE ALASKA LAND MOBILE RADIO (ALMR) SYSTEM?

Understanding the answer to this question requires one to understand the cooperative relationship enjoined by the participating federal, state and local public safety entities. That is, that State of Alaska (SOA), Alaska Municipal League, Federal DoD and Federal Non- DoD have partnered to address the requirement for security and interoperability, identify a solution and to establish a migration path to that solution. The objectives of the cooperative is to promote a system development by sharing existing resources, burden sharing system costs for implementation and operation that maximizes economies of scale, and initiates consolidated procurement and maintenance activities. The result is an ALMR system that provides the needed communications capability for State, local and federal first responders and public safety entities in Alaska, through an integrated wireless network, that is secure and interoperable, that is cost effective and technologically sound.

WHY DO WE NEED A LAND MOBILE RADIO SYSTEM?

This is a complicated question, but essentially, it is currently the way first responders and public safety officials communicate. The reason that public safety first responders use ALMR systems is because they provide a private dedicated wireless communications capability in the mobile environment where these agencies primarily operate. The use of other systems such as cellular and the public telephone does not provide by law, the priority and security required by first responders in public safety roles.

WHAT DOES INTEROPERABILITY MEAN?

Interoperability has many meanings, but the most basic as defined by the Federal Communications Commission (FCC) is “an essential communications link within public safety and public service wireless communications systems which permits units from two or more different entities to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results”. Public safety entities engage in three types of interoperability, day-to-day, mutual aid and task force interoperability.

IS THERE A FEDERAL REQUIREMENT TO DEVELOP AN INTEROPERABLE SYSTEM?

All states were required under the Federal FY 2007 Homeland Security Grant Program to develop and adopt statewide communications interoperability plans by December 2007. The SOA submitted a grant request under the Public Safety Interoperable Communications (PSIC) grant program through the Department of Military and Veterans Affairs (DMVA). This program, administered by the National Telecommunications and Information Administration (NTIA) and the Federal Emergency Management Agency, National Preparedness Directorate requires that interoperability be addressed on a statewide basis. The ALMR System is not a statewide system, but it does cover Alaska’s population centers.

HOW ARE WE GOING TO HELP PARTS OF ALASKA NOT USING ALMR?

The current ALMR site build out and coverage footprint is primarily in the Interior, Southcentral and Southeast areas of the state. For areas of Alaska not currently within ALMR coverage, the SOA DMVA has coordinated with state and local agencies to develop a Statewide

Communications Interoperability Plan (SCIP) to address the interoperability needs of those areas. The plan envisions local entities applying for federal grants to purchase communications equipment to allow them to communicate with regional response communities through portable tactical interoperable IP gateway devices.

WHAT IS A TRUNKED LAND MOBILE RADIO SYSTEM?

In two-way radio communications, trunking refers to the automatic sharing of a small number of radio channels between a large number of radio users. A trunking system efficiently distributes message traffic among the available channels and reduces channel waiting time.

WHY IS THE ALMR SYSTEM IMPORTANT?

- ALMR provides a single, shared and secure interoperable communications system for all emergency responders along the State's road corridors: SOA, local municipalities, DOD and Federal non-DOD agencies.
- ALMR satisfies mission and role requirements for 911, Homeland Defense, Homeland Security and Defense assistance.
- ALMR meets the day-to-day needs for all participating agencies.
- Day-to-day ALMR system use generates the knowledge and expertise of system use when needed for an emergency that requires interoperability across various agencies.
- Satisfies FCC mandated Narrow Band requirements for 2012 within ALMR footprint.
- The ALMR system generates cost efficiencies for all agency users by providing an interoperable communications system that meets dual demands for day-to-day use as well as for higher levels of emergency response and incident command.
- The ALMR consortium structure generates cost efficiencies for implementation, operations and maintenance.

WHY CAN'T WE CONTINUE USING THE CURRENT APPROACH AND SYSTEMS INSTEAD OF CHANGING TO THE ALMR SYSTEM?

We can. However, it will continue to be inefficient, and interoperability between first responders severely handicapped. The federal government has to move to a new system that supports narrow band technology and public safety communications standards by 2012. The SOA system is over 25 years old, and is in need of replacement. This is an opportunity to implement a cost shared, standards based, communication solution that will allow most public safety responders from all levels of government to have interoperable communications for day to day use, when mutual aid is required such as during natural and manmade disasters, and during task force operations such as homeland security roles and missions.

WHY NOT USE FIBER OPTIC CONNECTIVITY INSTEAD OF MICROWAVE?

Fiber optic connectivity has some potential advantages over microwave technology to link ALMR sites. However, many of the current ALMR sites are constructed in areas without access to existing fiber optic cable. Additionally, using existing sites and infrastructure has substantially reduced the overall costs of implementing ALMR. Operating the ALMR system on the existing State of Alaska Telecommunications Systems (SATS) microwave backbone also provides a stand-alone communication system unencumbered by commercial traffic. Long-term development and expansion of the SATS system requires examining the incorporation of fiber optic connectivity where appropriate, especially as the private telecommunications industry continues to expand its fiber optic footprint.

WHY NOT USE SATELLITES INSTEAD OF MICROWAVE TOWERS?

ALMR provides communication infrastructure in support of emergency first responders i.e. police, fire, and Emergency Medical Services. By law these agencies are required to communicate via LMR in a specified spectrum range and are “dispatch centric,” meaning they provide the capability for communication from one (dispatch) to many (field units). Radio sites with antennas would still be required to broadcast the signal to the radios carried by the first responders. Additionally, satellite connectivity for day-to-day operations would be considerably more expensive than the current microwave technology to deploy and operate.

WHY NOT HAVE EVERYONE USE GATEWAYS INSTEAD OF TOWERS?

ALMR is installing the Motorola version of gateways named “Motobridge.” Motobridge is an IP-based, software switched technology that allows first responders across disciplines and levels of government to communicate with one another regardless of the type of system or frequencies they normally use. When installed and appropriately programmed, Motobridge allows disparate radios to communicate when necessary, with ALMR radio users through consoles and other portals integral to the ALMR infrastructure. Since public safety is a dispatch centric operation, Motobridge is also dispatch centric in operation, thus maintaining dispatch control of radio traffic. Gateways provide limited, voice only interoperability and require that a donor radio from the disparate radio system be connected to the gateway to allow the radio to communicate, through the gateway, with ALMR radios. Using an ALMR radio on the ALMR system provides full interoperability which is recommended goal of the Federal Department of Homeland Security (DHS).

WHAT HAPPENS IF THE ALMR PROJECT IS NOT SUCCESSFUL?

Implementation, operations and maintenance of a fully interoperable communications system will become cost prohibitive for most participating agencies due to:

- Duplication of costs for infrastructure operations, maintenance and continued implementation.
- Requirement by most municipalities to build-out a new communications infrastructure to meet local system needs as well as to satisfy the FCC Narrow Band 2012 mandate.
- Elimination of cost and use efficiencies of a shared-trunked communications system.
- Local municipalities, and possibly the SOA, could be forced to return to a conventional, non-trunked system with reduced capacity and capability.
- Limited access to other agency systems by some participating agencies due to the inability to meet and maintain federally mandated security requirements.
- SOA costs to meet mandated FCC Narrow Band 2012 mandate will increase significantly.

CURRENT ALMR USERS

STATE OF ALASKA	
Public Safety/Troopers	
Natural Resources	
Administration (ETS)	
Military & Veterans Affairs (DMVA)	
Environmental Conservation	
Transportation & Public Facilities	
Corrections	
Alaska Railroad Corporation	
SUBTOTAL	4,372
LOCAL MUNICIPALITIES & NGO'S	
Anchorage	
ALMR municipalities and NGO's	
SUBTOTAL	3,535
DEPARTMENT OF DEFENSE (DoD)	6,142
FEDERAL NON-DoD	
FAA	
FBI	
Federal Protective Services	
IRS	
National Park Service	
NOAA – Fisheries Enforcement	
Alcohol, Tobacco, & Firearms	
Department of Justice (DEA)	
Bureau of Land Management	
U.S. Customs	
U.S. Marshals	
U.S. Fish & Wildlife Service	
SUBTOTAL	560
TOTAL	14,609

Numbers are calculated as of 12/2009

DOES THE ALASKA MARINE HIGHWAY SYSTEM (AMHS) AND THE U.S. COAST GUARD USE ALMR?

ALMR is an LMR system and by federal law can only be used on land. ALMR uses a different spectrum allocation than maritime radios. AMHS and the U.S. Coast Guard are required to conduct their communications in the maritime band. A gateway can be used to allow communications between land mobile radios and maritime radios when situations require. However, AMHS and the U.S. Coast Guard cannot use ALMR for their day to day maritime operations.

ARE OTHER STATES ARE USING ALMR?

Like Alaska, many states are implementing P-25, trunked, voice over IP communications technology like ALMR. ALMR is the name chosen by the ALMR

Executive Council for the Alaska system. While states have the latitude to adopt technology they choose for the development of an interoperable communications system, the Federal government has adopted the P-25 technology for LMR communications as its standard and has mandated states seeking federal funding for system development install P-25 compliant systems.

Colorado	Montana
Connecticut	New Hampshire
Delaware	Ohio
Illinois	Oklahoma
Indiana	South Carolina
Iowa	South Dakota
Kansas	Utah
Kentucky	Wisconsin
Minnesota	Wyoming

WHAT FEDERAL AGENCIES ARE USING THE P-25 STANDARD?

Department of Defense	National Telecommunications & Information Administration
Department of Energy	U.S. Border Patrol
Department of Interior	U.S. Customs
Department of the Treasury	U.S. Defense Information Systems Agency
Drug Enforcement Administration	U.S. Fish & Wildlife Service
Federal Bureau of Investigation	U.S. Forest Service
Federal Communications Commission	U.S. Immigration & Naturalization Service
National Communication System	U.S. Marshal Service
National Institute of Justice	U.S. Park Service (Police)
National Security Agency	U.S. Secret Service

Source: Telecommunications Industry Association (TIA) website

DO ALMR RADIOS WORK ON SYSTEMS OUTSIDE ALASKA?

The P-25 standard facilitates subscriber radio interoperability. ALMR subscriber units are capable of functioning on other P-25 trunked systems. However, for security reasons, using another public safety system requires deliberative planning and programming of radios to enable access. If it is highly probable that radios from a system like ALMR would need to operate on another public safety system, such as in the State of Washington, operational planning and agreements could accommodate this need. Otherwise, ALMR maintains a cache of radios that can be provided to agencies coming into Alaska that will need to operate on the ALMR System. ALMR's Motobridge gateways also provide the ability to add radios from another state onto the ALMR System.

WHAT WILL HAPPEN IF THE STATE OF ALASKA DOES NOT PARTICIPATE IN THE ALMR SYSTEM?

Communications inefficiency will continue to occur with our public safety agencies. Their existing systems will still require replacement because they are old, outdated, and are difficult and expensive to maintain.

WHAT WILL HAPPEN IF COMMUNITIES DO NOT PARTICIPATE?

The communities that choose not to use the system will continue with their existing systems that don't provide for full user interoperability for day-to-day, mutual aid and task force situations. Other system interface provisions can be researched to allow some lesser degree of interoperability, but at the detriment of the new infrastructure, which must reduce its capability to that of the lesser connected system at that time.

WHAT IS THE COST OF NOT PARTICIPATING?

The increased possibility of a situation of loss of life and property due to the inability of effective interoperable communications between first responders and public safety entities during day-to-day, mutual aid and task force responses.

WHAT HAPPENS IF WE FISCALLY SUPPORT THE PROJECT TODAY AND IT IS NOT SUPPORTED IN FUTURE YEARS? IS THE MONEY COMMITTED TODAY WASTED?

The extent of the system build out will depend on the funds allocated to the project. The system is designed with a "building block" approach and can be added to once more funding is identified. Money will not be wasted.

WHAT DOES FEDERAL GOVERNMENT IS "MANDATED TO GO TO NARROW BAND" MEAN?

In an effort to take advantage of technology and maximize the use of the severely crowded federal radio frequency spectrum resources, the U.S. Department of Commerce NTIA mandated the migration of all federal LMR systems from wide-band 25Khz channels to a narrow-band 12.5Khz channel depending on the radio frequency spectrum they will operate in by 2012. This will effectively double the available radio frequency spectrum resource in these the critical LMR bands and will require all federal agencies to replace their existing LMR infrastructure and implement either analog or digital narrow-band solutions.

WHAT DOES BACKWARD COMPATIBLE MEAN AND WHY IS THAT CONCEPT IMPORTANT FOR THE ALMR SYSTEM?

Backward compatibility will allow a given radio the ability to operate on their exiting systems while providing the capability to work on the proposed ALMR System. Agencies will be able to make near term portable and mobile equipment purchases that work on their existing systems allowing for a smooth system migration.

WHAT COMMUNICATION STANDARD WILL WE USE FOR THE ALMR SYSTEM?

Standards are required for interoperability and essentially define the overall architecture of the system. The Rockefeller-Morella Act (Public Law 104-113) permits Federal agencies to cite standards development in an open environment, under the aegis of an accredited voluntary industry standards organization. The Telecommunications Industry Association (TIA) is one of these organizations. Industry standards for LMR for public safety use are prepared under the auspicious of the Association of Public Safety Communications Officials (APCO) and the TIA. This set of standards, known as Project 25 TIA 102 has been selected by the cooperative partnership of the ALMR.

WHY USE A STANDARD?

Without adhering to a standard the state, local and federal public safety entities will essentially be compelled to implement system solutions that have the same interoperability and security

problems as the existing systems. There are four barriers to implementing a secure and interoperable LMR capability between the different entities. They are spectrum, technology, planning and funding. Three of the four, spectrum, technology and planning, can be overcome through a cooperative standards approach by the different government public safety entities.

WHAT IS TECHNOLOGICALLY POSSIBLE FOR AN LMR SYSTEM, WHEN WE CHANGE TO NARROW BAND FREQUENCIES AND DIGITAL COMMUNICATIONS?

When the only nationally recognized standard for public safety is implemented for ALMR, it will provide digital, narrow-band radios with the best performance possible, to meet all public safety user needs, and to permit maximum interoperability. Secondly, maximum spectrum efficiency will be obtained. The features provided for by the Project 25 standards are too numerous to list or discuss here. Every user need that the APCO, the National Association of State Telecommunications Directors, and the federal users identified was provided for in the standards.

These features and capabilities are all listed and explained in the published Project 25 documents. Of most importance, is that the APCO 25 standard was developed based on user needs, and then approved by the APCO Project 25 Steering Committee (representing federal, state and local governments) before being published as a TIA standard. First and foremost the standard will provide the interoperability required on demand and in real time at the voice level using a common air interface between equipment which is the most critical basic interoperable need by first responders from different government entities responding to an emergency.

WHAT IS THE CONCEPT DEMONSTRATION PROJECT FOR THE ALMR SYSTEM GOING TO TEST?

The ALMR project team has developed ten functional goals that will be tested during the Concept Demonstration Project which are:

- Wide area connectivity
- Airport/Municipality of Anchorage connectivity
- Remote FAA ANICS connectivity
- Anchorage/Juneau performance
- Interoperability with Fairbanks public safety responders
- Air to ground
- Multiple vendor subscriber unit testing
- Maritime connectivity
- Mobile data transmission

As important as the functional goals and testing is the business practices and plan developed during this initial phase of the project is equally important. Currently, a full business model and will be ready for implementation based on the lessons learned and input from all partners and related user base. This business model will include governance structure, operations and maintenance plans, procurement methodology and implementation plan for the full ALMR system deployment.

WHAT IS SATS (STATE OF ALASKA TELECOMMUNICATIONS SYSTEM)?

SATS is a 155-site microwave infrastructure that provides two major functions:

1. SATS is the backbone of the State's communications services, outside of Anchorage/Juneau leased circuits, supporting State agency use for:

- ✓ Computer WAN
- ✓ Data (Seismic, SCADA, Differential GPS)
- ✓ Video Conferencing
- ✓ Alaska Rural Communications System (Television)
- ✓ Interstate and Intrastate long distance telephone services
- ✓ Highway call boxes
- ✓ ALMR
- ✓ Dedicated data/voice/video transmission

2. SATS is the backbone of an extensive conventional 2-way radio/paging communications system, primarily outside the area currently served by ALMR. An infrastructure of 240 transmission and repeater sites supports:
 - ✓ 9,700 RADIOS
 - ✓ 700 PAGERS

WHO USES SATS?

All State agencies use the general communication services provided by the SATS microwave backbone system including the WAN, long distance and video transmissions.

The primary users of the 2-way radio and ALMR services include:

State of Alaska*	Municipal Entities
Public Safety (Troopers)	Police
Natural Resources (Forestry & Parks)	Fire Fighters
Transportation and Public Facilities	Health & Safety Officers
Alaska National Guard	Hospitals
Military & Veterans Affairs (Homeland Security/Emergency Communications)	Emergency Medical Services
Environmental Conservation	Municipal Entities
Corrections	Police
Alaska Railroad Corporation	Fire Fighters
Tsunami Warning Center	Health & Safety Officers
	Utilities
	Electric Power Plants