

MONTANA

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INTEROPERABILITY MONTANA

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Introduction

By Jane Jelinski

Interoperability is defined as “the ability to share information via voice and data signals on demand, in real time, when needed and as authorized.” [1] The concept has been discussed since 1935, but little progress has been made until recently. “Some regions and metropolitan areas have moved ahead, but in general, we are still in the stone age of interoperability. If a 9/11—like disaster would happen today, in most jurisdictions we would still have to use runners to communicate among first responders.” [2]

Numerous challenges exist—the usual geographic and financial constraints and the more complicated political jurisdictional issues. Local law enforcement agencies understandably want to maintain control over their communication systems to assure they are secure. In addition, first-responders utilize internal communications most often, and consequently invest their limited time and financial resources internally. Extra-jurisdictional communications have not been a priority. A series of catastrophes - 9/11, Hurricane Katrina, the Southeast Asian tsunami to name a few, have startled us into recognizing that the importance of an effective interoperable communication system cannot be overstated. The National Governor’s Association has named interoperability as its top priority and has provided some funding for planning. The Montana legislature and the federal government have also directed additional fiscal and personnel resources for this project.

While financial support and technological improvements are important, coordination, cooperation and standard operating procedures are the keys to success. Jim McKay, Associate Editor of Emergency Management writes, “Governance, not technology, is the key to interoperability.” [3]

Montana is fortunate to have countless public safety professionals who have been working assiduously for years to build an emergency communications system that meets the goals of interoperability. Unlike in most other states, Montana’s system is being developed from the bottom up rather than as a state imposed mandate.

This issue of Montana Policy Review is intended to inform all of the stakeholders of the progress of Montana’s interoperability development. Local government officials, tribal governments, legislators, state agencies and all first responders need to be informed and involved as Interoperability Montana progresses.

Endnotes

1. http://www.govtech.com/gt/articles/102350?id=102350&story_pg=1
2. Viktor Mayer-Schonberger, “The Technology Trap,” Government Technology.
3. Ibid

Interoperability Montana Project Fact Sheet

<http://interop.mt.gov/>

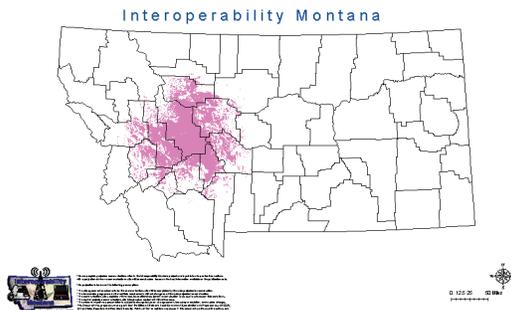
Prepared by Mark Adams, IM Project Manager, Northrop Grumman

April 2007

The State of Montana's Homeland Strategic Plan requires the establishment of a Montana-wide, interoperable communications public safety system. To that end nine Montana Consortia directors formed the Interoperability Montana (IM) Project through a Memorandum of Understanding signed on November 14, 2005.

The nine consortia (I-15-90 Corridor, Big Sky 11, Central Montana, Eastern Tier, Northern Tier, South Central Montana, Tri-County and the Western Interoperability Consortium. Mobile Data Terminal), now with 3 State of Montana agencies (Highway Patrol, Department of Transportation, Department of Natural Resources and Conservation), collectively represent all 56 Montana counties and 7 tribal nations in addressing their public safety communications needs. Joining the IM Project are multiple partners at the local, state, tribal and federal level.

The IM Project is building on Concept Demonstration Project I (CDP I) and Concept Demonstration Project II (CDP II) to create a system which will seamlessly link voice and data systems used by federal, tribal, state, local, and private sector public safety responders.



CDP I Coverage

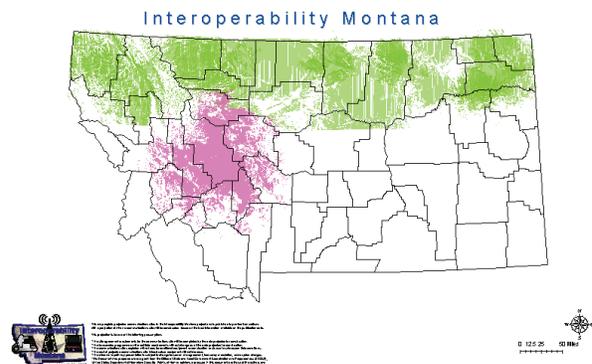
Concept Demonstration Project II

CDP II is currently under development in the NTIP and is scheduled for completion in Fall 2008. It builds off of CDP I and links 23 radio sites into the IM system.

CDP I and CDP II (when operational) will provide a single public safety communications system that serves 13 counties and 4 Indian Nations, with radio communications along Montana's 550 mile border with Canada.

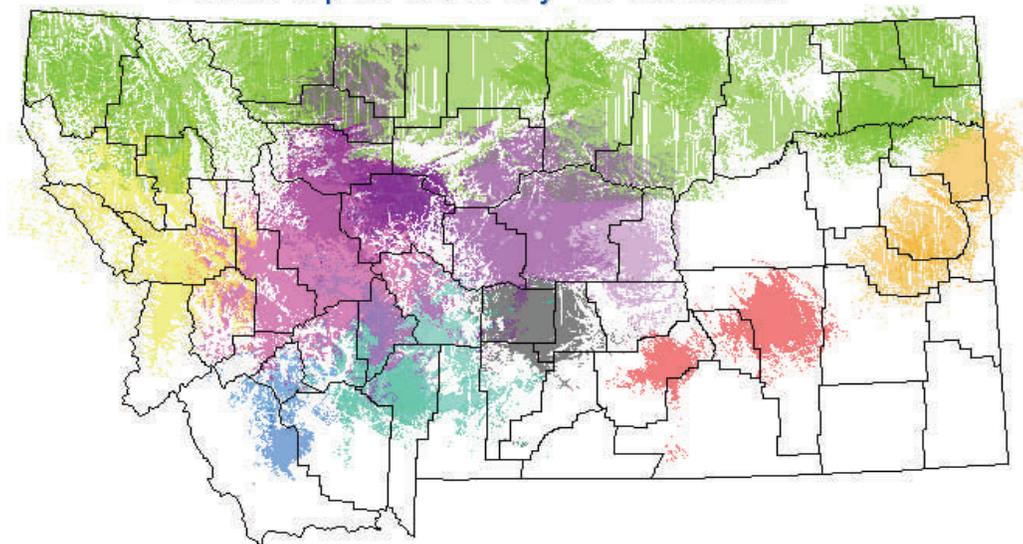
Concept Demonstration Project I

CDP I was completed in Lewis & Clark County and established an 11 site P25 trunked-hybrid Motorola Smartzone system consistent with the SIEC Definition and Technical Requirements.



CDP I & II Coverage

Interoperability Montana



IM Phase I Coverage

Interoperability Montana

The Interoperability Montana Project continues to build out public safety communications by linking 29 additional sites into the system. These sites incorporate the latest in communications site standards for grounding, power and data connectivity. They are connected through a high-capacity protected digital microwave backbone.

IM Project Directors

Providing project definition and oversight are the directors of the nine consortia throughout the state plus the three state agencies. The directors wholly represent the local communications needs of their communities and work together to collaboratively build a shared system designed to improve the safety of their residents and the responders who serve them.

IM Governance Committee

The IM Governance Committee works under the guidance and direction of the IM Project Directors and is tasked with defining a structure which addresses short and long term maintenance and governance of the IM system.

IM Technical Committee

The IM Technical Committee also works under the guidance and direction of the IM Project Directors and is tasked with the design and development of the IM system. The IM system is designed under guidelines provided by the Senior Advisory Committee:

- All consortia see improvement.
- Sites should be on or a single hop away from the digital microwave backbone.
- Sites should fill in dead spots that will be located along the backbone once it is completed.
- Trunk sites should cover major transportation arteries or population centers.
- Sites should have a significant impact on multiple consortia and/or multi-jurisdictions.
- The IM should address projects that exceed scope and ability of local/tribal funding.

This fact sheet was prepared under a grant from the Office of State and Local Government Coordination and Preparedness (SLGCP), United States Department of Homeland Security. Points of view or opinions expressed in this document are those of the authors and do not necessarily represent the official position or policies of SLGCP or the U.S. Department of Homeland Security



**Interoperability Montana:
The Building Blocks
By Cheryl Liedle and Chris Christensen**

Montana's Communication History

The idea of a connected and compatible statewide Public Safety Land Mobile Radio System (LMR) in Montana has been discussed and studied for over 20 years. Like most states, local, tribal, state and federal responders developed independent Land Mobile Radio (LMR) communication systems to assist responders in protecting lives and property. In most cases, these systems were developed without regard to the operation of neighboring jurisdictions or the needs of multiple agencies.

Currently, the infrastructure of state and local response communities in the state is aged and in need of improvement. Systems are built on a local basis, often with no coordination with other response groups in regional areas. Response organizations may be utilizing incompatible or limiting radio systems with other responders.

The need for LMR 'interoperability' of local, state and federal agencies for significant events is very important. In the past twenty years prior to the Interoperability Montana Project, two significant attempts were made at providing the responders in Montana with interoperable communication assets. Following the conversion of many response agencies to the very high frequency (VHF) band in the 1970's and 1980's, the State of Montana, along with fire, law enforcement and EMS response organizations, developed the State of Montana Mutual Aid and Common Frequency Plan in 1990. This plan established fourteen (14) Mutual Aid frequencies and five Common Frequencies (all known as the 'Color' Channels) for use during interagency operations. Also identified are the Montana Mutual Aid Repeater Frequencies and National General Use Interoperability Narrowband Frequencies.

The plan outlines the use, rights and responsibilities of each response agency to use the spectrum and what state and Federal Communication Commission rules must be followed. The plan also defines the suggested operational use of each frequency during mutual aid responses and presents formats for Incident Communication Plans, and discusses the importance of the Incident Command System in response operations. Currently, most local, tribal, state and federal agencies in Montana have limited interoperability capability utilizing the statewide mutual aid frequencies operating in simplex mode. For normal, localized incidents, this works well but falls short of interoperable communication needs for large-scale incidents and disasters.

A second attempt at defining and developing a Montana-wide LMR communication system occurred in the mid to late 1990's. Two studies were completed that identified state and local resources, reviewed needs and developed draft proposals for building a connected, Montana-wide system. However, due to limited funding and the inability to come to agreement on governance and sustainability issues, the proposal never took root.

The terrorist attack of September 11, 2001, became a catalyst for developing comprehensive, interoperable communication systems. During this and subsequent natural disasters, the shortfall of clear, reliable, and interconnected communications was demonstrated with tragic results. Following these lessons learned, Montana local and state agencies, along with regional groups, began to evaluate ways of improving communication and response effectiveness. Working up from the grassroots level, local emergency responder agencies responded with mutual cooperation, including using a variation of the old-fashioned “barter system” to combine resources to their mutual benefit.

New Beginnings

Following 9/11 at the request of the Department of Homeland Security, the Governor created the Montana State Interoperability Executive Council (SIEC). The purpose of the SIEC is to create policy level advocacy for interoperability with regard to public safety communication in Montana. Two projects were designated as Concept Demonstration Projects (CDP) by the State Interoperable Executive Council (SIEC). CDP#1 – Lewis and Clark County, demonstrated the digital/trunking technology with a deployed, county wide system involving all responders with a public safety radio. CDP#2 – the Northern Tier Interoperable Project, developed a strategy to build upon the Lewis and Clark County concept to a regional network, linking all law enforcement, fire and EMS agencies along the Canadian border with the Lewis and Clark system. This formed the foundation of future statewide planning.

The foundation for the Lewis and Clark County project began even prior to 9/11. In 1999, the Lewis and Clark County Sheriff’s Office budget showed a deficit of \$500,000 in funds needed just to maintain regular operations. The county formed a citizens advisory group, which brought to light several

problems, including a failing communications system. The advisory group recommended a ballot measure for an ongoing mill levy, part of which would be earmarked for communications (\$125,000 annually).

That ongoing levy led to other forms of assistance, including a FEMA grant in 2002 and endorsement by the governor in the same year as a concept demonstration project. Additional grant funding allowed the project to purchase radios for not only the sheriff’s department, but also for fire services, public works, the health department, and various state agency offices. The consortia members learned about working with vendors and came up with a concept for a hybrid system using both VHF and digital radios. Repeater towers were built, and agreements were reached to share existing sites with other agencies.

The Lewis and Clark system began operations during November 2005. Prior to the system becoming operational, the second Concept Demonstration Project, the Northern Tier Interoperability Consortia (NTIC) was formed. The NTIC was born following a meeting of law enforcement agencies in Havre in 2002, when Senator Max Baucus asked what could be done to improve law enforcement operations along the Canadian Border. The overwhelming response was to improve interoperable communications.

The Northern Tier was formally organized in 2004 and seed money in the form of Homeland Security and 2005 State of Montana legislative funds created an initial pool of over \$10 million dollars. Shortly after the NTIC began operating, the Board voted to adopt the Lewis and Clark County technical approach and build off the system developed in Helena. This formed the backbone of what is to become the Montana-wide effort known as Interoperability Montana.

The Importance of Definitions and Standards

To develop optimum interoperability, LMR systems must be developed on a standards based shared system, allowing continuity for the entire local, state and federal response community. A standard, compatible mechanism must be deployed linking agencies and consortiums around the state.

Initial efforts to establish the standards based system began through the State Interoperable Executive Council (SIEC). The Statewide Interoperability Executive Council is comprised of local, state, federal, and other public service agency representatives. Its purpose is to provide policy level direction for matters related to planning, designing and implementing guidelines, best practices, and standard approaches to solve Montana's public safety communications interoperability problems and to leverage any opportunity in support of a statewide system, including seeking federal funding, or other funding, for statewide interoperability. Sharing of a common radio infrastructure will eliminate duplications of capital investment projects reducing total radio communications cost for each participating agency.

After the initiation of Lewis and Clark County and the Northern Tier projects, other regional and local projects began to form. This led to the creation of eight voice and one mobile data consortium. Because of the need to consolidate and coordinate these efforts, the Montana SIEC adopted a 'Definition of Interoperability'. This definition allows a common platform to build interoperability communications throughout the State of Montana. The definition adopted by the SIEC includes the following:

**SIEC Definition Statement
(Public Safety Land Mobile Radio):
Definition Statement:**

Interoperability refers to the ability of public safety emergency responders to work

seamlessly with other systems or products without any special effort. Wireless communications interoperability specifically refers to the ability of public safety officials to share information via voice and data signals on demand, in real time and when needed.

In addition to the definition of interoperability, the SIEC adopted technical standards for interoperability projects in Montana. They include:

Technical Requirements:

The technology needed to meet the Interoperability Definition is that public safety radio communications in Montana will be a standards-based shared system of systems. The radio system will be a wide area system for use by public safety responders.

Through the deployment of a migration plan that identifies the steps and process for each participating agency, the system will combine P25 trunked and P25 digital / analog conventional technologies to provide interoperable communications among P25 narrowband digital trunked and existing conventional users. All equipment must be compatible and seamlessly integrate with infrastructure equipment deployed in CDP 1 - Southwest Interoperability Project and CDP2 - Northern Tier Interoperability Project. It will operate narrowband in the VHF frequency range and will use a protected high-capacity digital microwave backbone for voice and data interconnect traffic.

The system will provide advanced channel management for the shared use of frequencies, seamless roaming throughout the respective trunked areas (footprint) and enhanced responder safety through embedded signaling, while at the same time enhancing interoperable communication with existing legacy VHF radios. At a lower level of interoperability, the current mutual aid channels will be maintained and available for use.

While all agencies recognize the optimum goal of a trunked system, they will need to

migrate to trunking in a step/phased approach. With this ultimate goal, however, all agencies will purchase equipment that is trunking capable or upgradeable to trunking. Progression through these steps will vary in a given time based on operational needs, and ultimately funding available.

This approach will allow public safety responders in Montana to exchange voice and data communications on demand, in real time during emergencies and disasters.

Birth of the Interoperability Montana Project

In 2005, directors from the eight voice and one mobile data consortia came together to form the Interoperability Montana Project Directors Board (IMPD). The IMPD, along with its designated Technical Committee, provides direction and priority for development of the connected, statewide system. At this level, and to a lesser degree the consortia level, state and federal partners participate with planning and implementation steps. Some agencies, such as the Montana Highway Patrol, Montana Fish, Wildlife and Parks, and the Montana Department of Corrections, are planning to utilize the system as it is established. Currently, the State of Montana Department of Transportation, Highway Patrol, and Department of Natural Resources and Conservation are voting members along with the nine regional local representatives. Federal agencies such as BLM, Glacier National Park, FBI and BIA contribute assets and expertise in the process, including active assistance with planning and implementation steps. Many Federal agencies intend to use the system as a way to improve their communication capability and interoperability with local, state and tribal response organizations. Because of the mutual interest in seeing an interoperable communication system developed in Montana and the desire to establish a formal relationship to see this happen, a Memorandum of Understanding was devel-

oped between the State of Montana and DOI. The IMPD has hired r (Northrop Grumman Corporation) as a centralized Project Manager to ensure consistency with planning and project implementation.

This grass-roots organizational structure has resulted in positive outcomes in the organization and implementation of interoperable communications in Montana, with the vision of having a fully functional state-wide system with active local, federal, state and tribal users. Great progress has been seen, primarily due to the leadership from the local level. Because of the unique nature of this project and its organization, several key planning steps involving policies, standard operating procedures, and governance have not been completed or initiated.

The Interoperability Montana project is a comprehensive public safety communication project led by local agencies in Montana. The purpose is to develop a connected system based on the P25 national standard, thus improving communication capability and interoperability among law enforcement, fire, and EMS agencies on a local, tribal, state and federal level. Following IM Project organization in 2005, the Board of Project Directors adopted the definition of interoperability and technical requirements as established by the SIEC.

The Interoperability Montana Project Directors (IMPD) have the authority to evaluate and set priorities for interoperability projects in Montana. Recommendations for funding and system design are provided to the IMPD by the Interoperability Montana Technical Committee (IMTC). The IMTC evaluates sites and projects on technical and feasibility criteria, and recommends funding to the IMPD. In addition, important subcommittees such as the Frequency Subcommittee, Encryption Subcommittee and Governance Committee establish guidance and use of important resources within IM.

Consistency with SAFECOM Guidance

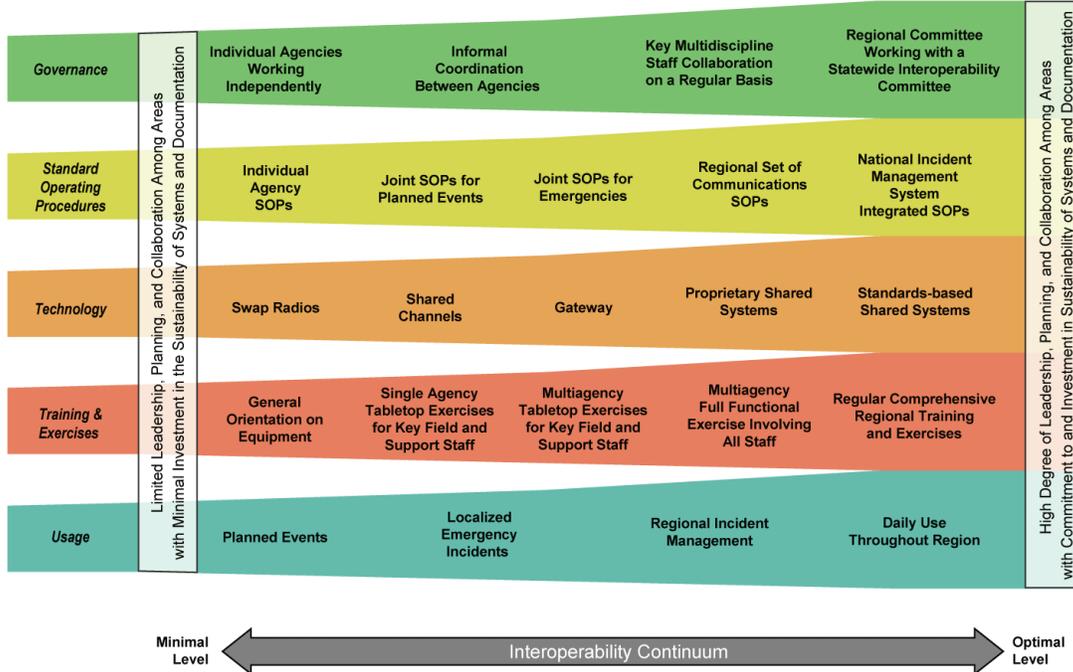
In addition to the requirements of the Montana Definition of Interoperability and Technical requirements, the Interoperability Montana project has adopted the SAFECOM interoperability guidance. This resource provides a simple and common methodology of evaluating the effectiveness of interoperable communication processes in five key areas:

- Governance
- Standard Operating Procedures
- Technology
- Training and Exercises
- Usage

It is the goal of the Interoperability Montana Project to move toward the optimal level of interoperability in each of these target areas, represented by the far right side of the chart found below. Through the grass root coordination of the IM project and adoption of standard technologies, this goal will become reality in the future.

Cheryl Liedle is the Lewis & Clark County Sheriff and Chair of the Interoperable Montana Project Directors Committee.

Chris Christensen is the Public Safety Services Bureau Chief of the Montana Department of Administration.





Governance Structure A Grass Roots Approach

By Tim Burton and Edward Sypinski

The State of Montana's Homeland Strategic Plan calls for the establishment of a Montana-wide, interoperable communications public safety system.

The lack of interoperable voice and data communications continues to represent a significant challenge for public safety responders. After decades of experience with this issue, it is clear to first responders and other emergency organizations that public safety communications and interoperability cannot be solved by any one entity. It requires a partnership among local, state, tribal and federal public safety organizations and industry.

The State of Montana's Homeland Strategic Plan calls for the establishment of a Montana-wide, interoperable communications public safety system. The State Interoperability Executive Council (SIEC) was named as executive policy agent in June of 2004 and defined interoperable communications as the ability of public safety emergency responders from local, tribal, state and federal agencies to communicate seamlessly, without any special effort.

The State of Montana and federal and local partners are committed to develop a system of systems that is compatible, meets established standards, and will provide interoperable radio communications statewide. The governance structure needs to be built from the bottom up with an emphasis on local control. Our goal is to establish a continuous funding mechanism for on-going maintenance, operations and expansion.

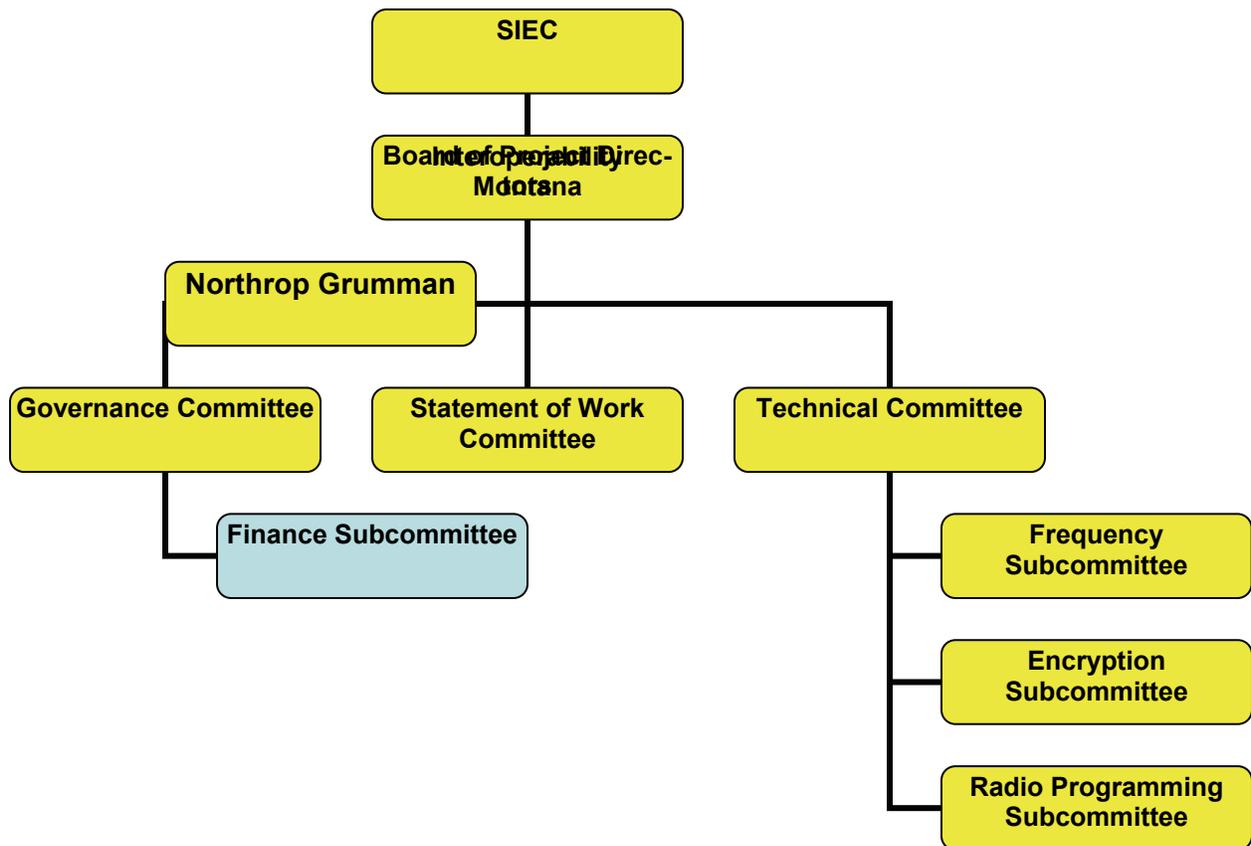
Organizational Process

The organizational process for conducting the project includes:

- Policy direction from the Statewide Interoperability Executive Council (SIEC)
- Project oversight and deployment with leadership from the Interoperable Montana Project Directors (IMPD), in cooperative agreement between the nine regional consortia and the State of Montana;
- A joint project team, consisting of technical and admin-

istrative staff from participating partners, to manage all phases of the project;

- Project technical direction from the Interoperable Montana Technical Committee (IMTC), which advises the project directors in matters of project scope and technical issues.
- The IMTC is a partnership of IMPD members, State of Montana agencies and Federal user groups which utilize wireless communications in Montana;
- Professional project management of all phases contracted through Northrop Grumman Corporation off the State of Montana’s MIS contract;
- Governance guidance and development through a partnership of user groups and administrative agencies forming the Interoperability Montana Governance Committee (IMGC).

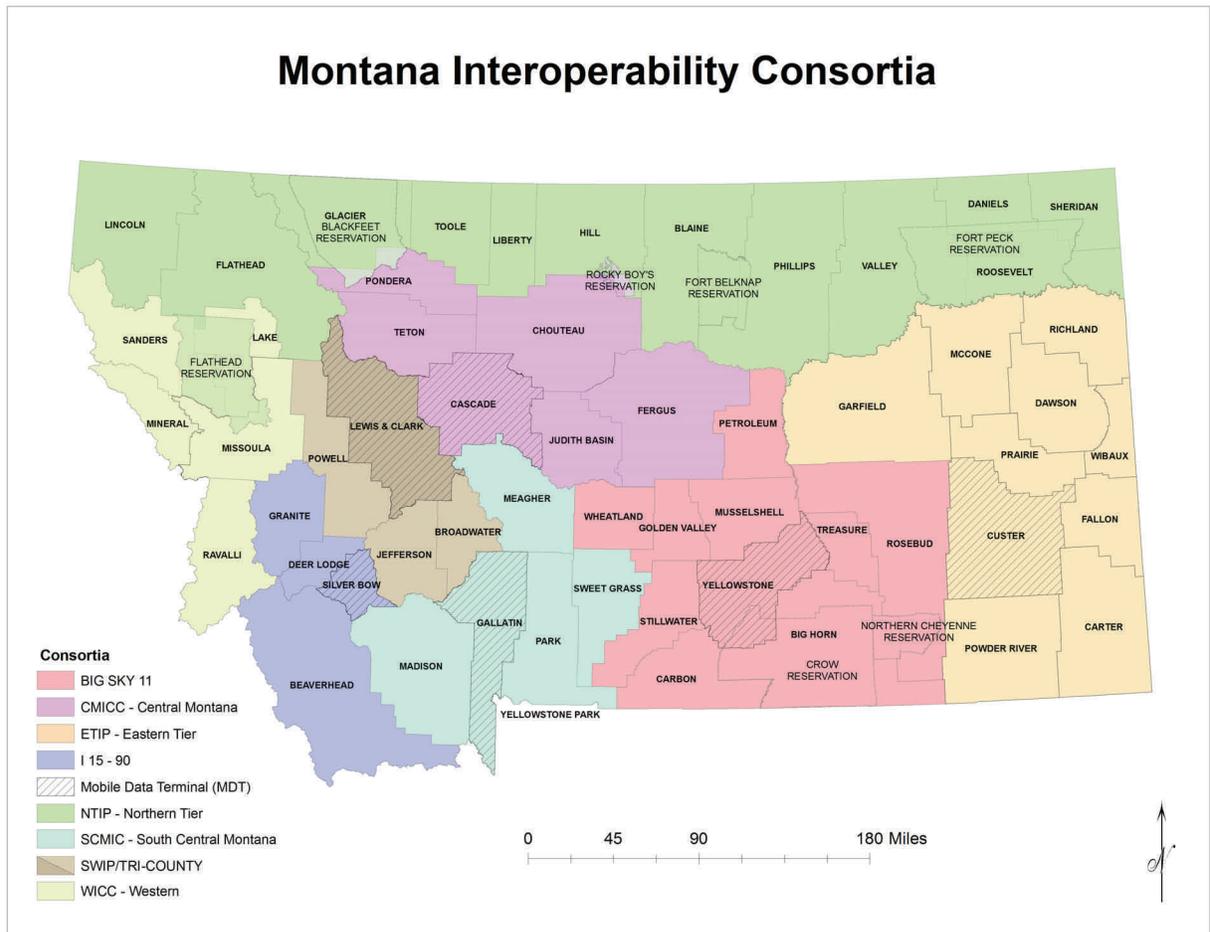


The Statewide Interoperability Executive Council (SIEC)

The SIEC is comprised of local, tribal, state, federal, and other public service agency representatives. Its purpose is to provide policy-level direction for matters related to planning, designing and implementing guidelines, best practices, and standard approaches to solve Montana’s public safety communications interoperability problems and to leverage any opportunity in support of a statewide system, including seeking federal funding, or other funding, for statewide interoperability. Sharing of a common radio infrastructure will eliminate duplications of capital investment projects reducing total radio communications cost for each participating agency.

To that end it shall:

- Establish a joint approach to wireless interoperability among public safety entities within Montana;
- Exercise authority for strategic decision-making with regard to Montana’s public safety communications by:
 - Researching and evaluating best practices;
 - Developing recommendations for statewide standards;
 - Fostering coordination and cooperation among agencies;
 - Making recommendations to provide statewide assistance;
 - Acting as an information clearinghouse;
 - Serving as a policy point of contact for local; regional, and national interoperability matters;
 - Developing recommendations for legislation that may be required to further promote interoperability;
- Considering other policy issues related to solving Montana’s public safety communications interoperability problems; and
- Exploring opportunities for inter-agency and regional systems and developing methods for inter-agency cooperation.



Consortia and Project Directors

The IM Project is a partnership of local, tribal, state and federal response agencies committed to improving and expanding interoperable communications throughout Montana. The partners are divided into three main categories: 1) Regional Consortia (representing local and tribal interests); 2) State of Montana Agencies (representing all levels of state radio users); 3) Federal and Private Partnerships. These partners have formed nine consortia to deploy the IM Project Montana. Consortium members have elected a project director to represent them on the Interoperability Montana Project Directors (IMPD).

The IMPD represents leaders from each consortium and serves as the operational governing board for the IM Project. The IMPD is a dynamic, cohesive group dedicated to the deployment of statewide interoperability for public safety responders. The IMPD provides project definition and oversight, the directors wholly represent the local communications needs of their communities and work together to collaboratively build a shared system designed to improve the safety of their residents and responders who serve them. This grass-roots partnership of local, tribal, and state government agencies is dedicated to a strategic deployment of Project 25, digital, secure voice and data communications across the state.

Northrop Grumman Corporation has been selected by the IMPD to provide Centralized Project Management (CPM). Use of CPM provides a cost-effective, coordinated approach to implementing Interoperability Montana. Part of the Statement of Work (SOW) for the CPM is to assist the IMPD and State of Montana to produce a detailed Montana Communications Plan.

As part of the IM Project, each of these consortia have agreed to work together and advance the development of interoperable communications infrastructure according to the priorities and funding established by the IMPD. Communications needs not addressed by the IMPD may be developed by the consortia, or individual agencies, as their own priorities and funding allow.

Interoperability Montana Governance Committee (IMGC)

The IM Governance Committee works under the guidance and direction of the IM Project Directors and is charged with defining strategies and developing structures that address short and long term governance and maintenance solutions for the IM Project. The governance structure will establish from the ground up a structure that will ensure a place at the table for all relevant agencies and users, which will formalize and ensure equality in the decision-making (e.g. all members have an equal vote as defined by their level of participation). This structure should be a vehicle through which agencies, local responders and users participating in the Interoperability Montana plan for, implement and manage an integrated interoperable radio system statewide.

The IMGC is made of representatives from the IMPD, Public Safety Services Bureau, the Governor's Office and other agencies. Thanks to a recent \$50,000 grant from the National Governor's Association, the IMGC is teaming up with Montana State University's Local Government Center to develop master strategies for approaching long-term governance and maintenance issues.

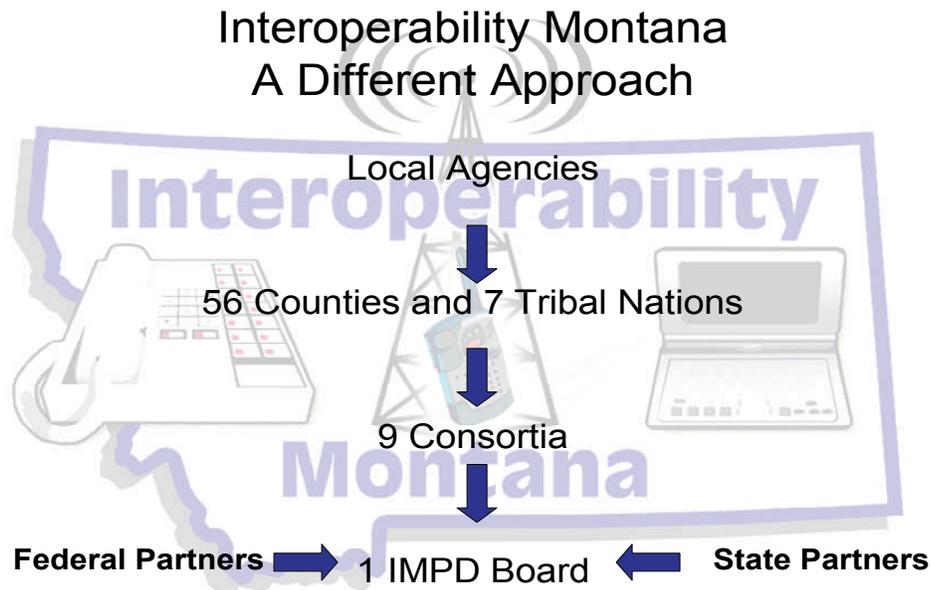
Interoperability Montana Technical Committee (IMTC)

Due to the highly technical nature of radio interoperability communications, the IMTC was formed to make recommendations to the IMPD on technical issues related to the design, implementation and operation of the IM Project.

The IM Technical Committee also works under the guidance and direction of the IM Project Directors and is tasked with design and development of the IM system. The IM system is designed under guidelines provided by the Senior Advisory Committee (SAC):

- All consortia see improvement.
- Sites should fill in dead spots that will be located along the backbone once completed.
- Trunk sites should cover major transportation arteries or population centers.
- Sites should have a significant impact on multiple consortia and/or multi-jurisdictions.
- The IM should address projects that exceed scope and ability of local/tribal funding.

The IMTC serves an important role in evaluating technology, determining technical specifications for equipment and sites, assessing communications sites, identifying frequencies, ensuring compliance with P25 standards, and addressing encryption and bandwidth issues. The IMTC formulated technical criteria that have been used to prepare a prioritized list of infrastructure projects, which the IMPD has adopted.



The Governance Committee is committed to creating a viable and sustainable structure for governance of a system of systems built from the grass roots with local control. The above graph represents our approach. We are now in the process of creating the interlocal agreements that will be considered by the consortia and the binding memorandum of understanding that creates the IMPD Board with representation from nine consortia, three state agencies and other yet-to-be-determined representatives.

Tim Burton is the Manager for the City of Helena and is a member of the IM Governance Committee

Edward Sypinski is the Associate Director of the Local Government Center, MSU- Bozeman



**Finance Issues Facing the
Interoperability Montana Project
By Chief Alan Michaels, William Fleiner
and Edward Sypinski**

The Interoperability Montana (IM) Project has grown out of the need for improved wireless public safety communications and the success of two Concept Demonstration Projects (CDPs) initiated in Montana since 2002. The idea of a connected and compatible statewide Public Safety Land Mobile Radio System (LMR) in Montana has been discussed and studied for over 20 years.

The need for LMR ‘interoperability’ of local, state, tribal and Federal agencies for both day-to-day and significant events is critical. Currently the State of Montana has a limited interoperability capability consisting of statewide mutual aid frequencies operating in simplex mode. For normal, localized incidents, this works well but falls short of interoperable communications needs for large-scale incidents.

Following recent disasters, the federal government began distributing funding to local governments and states through the Department of Homeland Security for preparedness and response activities. The State of Montana, Disaster and Emergency Services (DES) Division of the Department of Military Affairs has the responsibility for coordination of the Montana Homeland Security Senior Advisory Committee, (appointed by the Governor) and serves as the State Administrative Agency (SAA) for the Department of Homeland Security, Office of Domestic Preparedness (ODP).

Two projects were designated as CDPs by the State Interoperable Executive Council (SIEC).

CDP#1 – Southwest Interoperability Project in Lewis and Clark County, demonstrated digital/trunking technology with a deployed, county-wide system involving all responders with a public safety radio. This system set the standard for utilizing new technology in communication and is presently operational

CDP#2 – the Northern Tier Interoperable Project, developed a strategy that built upon a network of law enforcement agencies that were linked to all public safety agencies along the Canadian border with the Lewis and Clark County system. This formed the foundation of future public safety agency statewide planning.

As a result of funding priorities given to regional and state-wide communications planning, Montana counties and Indian nations formed into regional consortia for the purpose of planning and infrastructure development. These consortia were modeled after the Northern Tier Interoperability Consortium, which was established in 2004 by 12 counties and 4 tribes to address communications deficiencies for law enforcement agencies and other emergency responders along the Canadian border. This group, in partnership with the State of Montana, developed a communications plan and is currently in the final stages of completing the Northern Tier Interoperability Project, which will begin to become operational during the Fall of 2007.

Funding and Resources

Funding for the Interoperability Montana (IM) Project initially came from FEMA and Homeland Security Grant Programs. Additional funding is now coming from FEMA fire grants, state and other federal agencies. The Montana Legislature is actively involved in the funding of the Interoperability Montana (IM) Project. Development of this system is a partnership of local, tribal, state, and Federal resources. Sites owned by public agencies and private individuals are part of this process. The State of Montana and the IM Project Directors have signed a Memorandum of Understanding (MOU) agreement with the Department of Interior for site and resource sharing. Similar agreements are being developed by the IM Project with the U.S. Air Force which is contributing approximately \$1.9 million toward the IM Project and with the National Park Services (NPS) for developing a site that will be located within Glacier National Park and the Blackfeet Reservation that will be used by the IM Project.

Currently, the State of Montana through the Department of Administration, Information Technology Services Division, Public Safety Services Bureau, has in the Governor's 2008-2009 Biennium budget an \$8.5 million appropriation for the IM Project with \$3.5 million of this appropriated for a second Master Control Site to be located in Eastern Montana, the precise location to be determined. The other \$5 million is for a broad scope of project needs. The 2005 legislature approved \$3.5 million for the Northern Tier Project. Over \$40 million in Homeland Security and FEMA grants have been used for interoperable communications in Montana since 2001.

Future funding is expected to be from a combination of local and state funds from the Office of Domestic Preparedness State Homeland Security Grant Program and Law Enforcement Terrorism Prevention Program. Potential funding sources may include:

Federal appropriations,
Federal grants, including Department of Justice and Department of Transportation,
State of Montana appropriations, special revenue accounts, and/or user fees.

The Interoperability Montana Project has developed a number of important agreements and Memoranda of Understanding (MOU) at multiple levels to ensure the project moves forward in a best practice methodology; these include:

- Consortium Memorandum of Understanding: Agreements that formed the consortia and Board of Project Directors, signed by local agencies;
- Memorandum of Partnership Agreement: MOU that defines the responsibility and participation by partners, including the State of Montana, IMPD, U.S. Air Force and National Guard;
- Memorandum of Agreement (State of Montana and U.S. Department of Interior): An agreement that allows IM system sharing with DOI agents and the sharing of DOI radio sites and frequencies;
- Site Use Agreement: The document that outlines the rights and responsibilities of radio users at a particular site;
- Site Lease Agreement: The document that legally defines the term of leases for land, shelters and towers for the project;
- Equipment Acceptance Agreement: The document that local or state/tribal officials sign accepting ownership of the equipment purchased with Homeland Security money and guarantees use by the IM project.

Estimated Cost

While the current projected cost to design, develop and implement an interoperable radio and data system of this nature and scope has been in excess of \$150 million dollars, system “savings” have already been achieved. For example, tower infrastructure costs have been considerably less because consortium “partnerships” have demonstrated a need for fewer infrastructures to serve a Montana-wide system than would serve 56 individual county and 7 tribal reservation systems. State of Montana agencies have also agreed to maintain the vital microwave system. Continued system sharing and partnerships are cornerstones for this process.

Anticipated Projects will include cost categories for Project Management, Administrative Staffing, Build-out of the system, Network Management including regional dispatch centers, Maintenance and Operation, Training and Equipment which will include radios, base stations and subscriber units.

The following represents ‘potential’ procurements during 2007/2008 in support of the IM Project, if adequate local/state/federal funding is realized.

- Frequency Acquisition: Up to \$250,000 could be expended for obtaining VHF and microwave frequencies;
- Radio Site Infrastructure: Up to four million dollars of site upgrade and security may be completed;
- Microwave System Equipment: Up to \$2 million may be invested into digital microwave equipment;
- VHF Trunked Radio Equipment: Up to \$3 million to deploy trunked radio equipment throughout the state;
- Second Master Control Site: Up to \$3.5 million to establish a second Master Control Site;
- VHF Subscriber Units: Up to \$3.5 million of subscriber units may be purchased by local and State of Montana agencies in association with this project.
- Project Management: Up to \$1.6 million for miscellaneous project management activities; Planning: Up to \$250,000 for developing long-term strategic plans;

IM Project Funding

The State of Montana is committed to develop a statewide plan that establishes a formalized governance structure to sustain the statewide radio system and proposes a recommended continuous funding mechanism for on-going maintenance, operations and expansion. The funding structure would meet certain goals, identify types of revenue sources, and recognize funding needs and priorities to support the IM Project. Costs that will be incurred will be: Administrative, Build Out for the System, Capital Improvements, Maintenance & Operations, Repair and Replacement of radios, Technological Advances and Training and Exercises.

Lewis and Clark County Sheriff Cheryl Liedle, IM Project Directors Chairperson, on behalf of the IM Project, submitted a congressional budget request through Senator Baucus, for \$100 million over a four-year period. This request is being coordinated with Senator Tester and Congressman Rehberg. The appropriations request is for funding to complete the Northern Tier Interoperability Project and to continue the build-out of the statewide IM Project. This would include site acquisition, microwave development, SPECTRUM and radio subscriber unit acquisitions.

Administration: The future plan includes an Interoperability Coordinator that is a point of contact for the project that the Department of Homeland Security expects each state to have.

Operations & Maintenance: for system build out which would include towers, repeaters, shelters, programming of equipment and repair and replacement. When the project is completed statewide, it is estimated that annual ongoing maintenance costs will be between \$1,200,000 and \$1,600,000. The funding for this maintenance will come from a combination of sources, to include but not exclusively, State of Montana funding, federal grants, local and tribal contributions, federal user fees and other sources.

Risk Summary

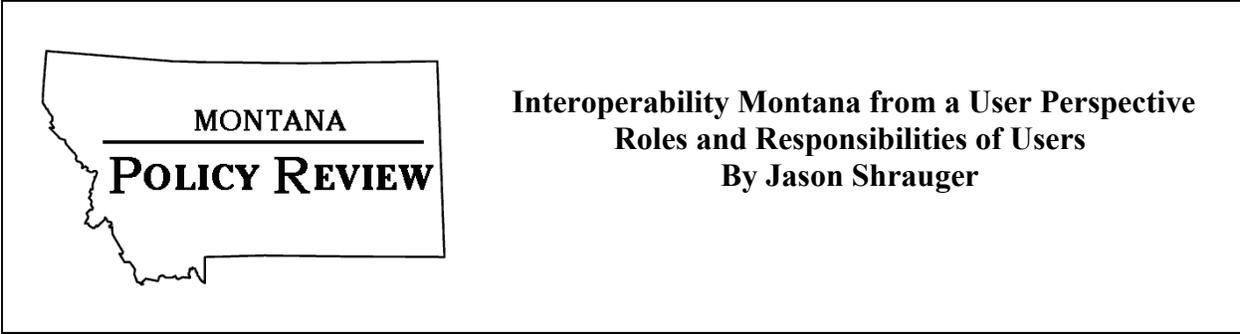
- **Lack of Adequate Funding to Build Infrastructure:** The amount of money required to build a ‘state-wide’ infrastructure will exceed \$100,000,000. That amount is not available at this time. The IM Project will require construction in phases, relying on federal and state appropriations and grants along with local and tribal funding.
- **Lack of Adequate Funding for Maintenance:** Once a ‘state-wide’ system is built, a consistent funding stream will be required for maintenance.
- **Local Ownership of Sites and Equipment:** Because Homeland Security funds require that 80% of money goes to local projects, equipment purchased with this money is placed in county/municipal ownership. Memoranda of Understanding and other agreements ensure shared use. The IM Project, Department of Emergency Services and the Public Safety Services Bureau, along with Project Manager Northrop Grumman Corporation, have developed a system to track ownership of equipment. This system also documents site lease agreements and site use agreements that are critical to the project. Agreements are in effect for a minimum of 10 years.

Funding Goals	Types of Revenue	Funding Needs	Priorities
Constant &/Secure funding streams	Revenue sharing from other sources	Administration	Establish constant revenue/funding for IM Project
Meet programs needs	Consortia/Regional funding districts	System Build Out	Minimize local system user fees
Allow for future technological advances	Grants, public/private partnerships, State & Federal Partners	Maintenance Repairs and Replacement	Define approximate costs to local governments
	Legislative Funding	Training & Exercises	
		Capital Improvements	

Alan Michaels is the Glendive Police Chief and Vice Chair of the Interoperable Montana Project Directors Committee

William Fleiner is the Montana Department of Corrections Quality Control Manager and the Chair of the Interoperability Montana Governance Committee.

Edward Sypinski is the Associate Director of the MSU-Local Government Center.



The important thing to remember about IM is that it is a “system of systems.” In most areas of the state, agencies will be joining the system at different levels and at different times.

The roles and responsibilities of users of the Interoperability Montana (IM) system vary based on the projected level of use at the local level. The important thing to remember about IM is that it is a “system of systems.” In most areas of the state, agencies will be joining the system at different levels and at different times. Presently, there is only one county completely on the IM system, however, other areas are planning for an early 2008 cut over date. Local agencies are looking at IM from several different perspectives. Some agencies plan to completely switch to the trunked level of the hybrid system and use it as their primary communications network, while others plan to use IM as “another tool in the communications tool box.” Still other agencies are looking at the IM system as a solution to their failing infrastructure, connectivity, and coverage needs. The exact way any community chooses to interface will define the roles and responsibilities it will have. Simply stated, the system is designed to meet a variety of needs and has always been inclusive, not exclusive.

It is important to remember that Interoperability Montana is a system designed by the users for the users, based on user defined needs. Agencies in the eight communications consortia and the Mobile Data project (MDT) participated in individual communications studies to benchmark existing communications systems which ultimately identified options to the shortfalls identified. These consortia plans eventually became the foundation for Interoperability Montana and are currently being used as reference points for state-wide build out of the system.

Several significant challenges have been identified as the group has contemplated build out of the IM system. One of the most significant is the differing levels of support across the state. Views and concerns vary widely from, “I will never use a system that puts the safety of my responders in the hands of a computer,” to “this is the best thing to

happen to public safety communication in a long time, and I don't know how we did without it." Healthy skepticism is a good thing and we have asked people to "buy in" to an idea that has significant costs and is different from what they are doing today. It would be surprising, and even worrisome, if the majority of Montana's responders did not ask the tough questions and demand sound answers to their questions. Issues like network reliability away from the core of the system in Lewis and Clark County, trunked radio access points to control user functionality in remote locations, capacity of the system, up time versus down time, and how agencies on the IM system communicate with responders who are not on it are just a few of the issues raised. As system build out continues along the Northern Tier, South Central Montana, Central Montana and the I-15/I-90 corridor, ground truth will be established and all will be able to make informed decisions about the system and its application in their particular circumstances.

The Project Directors firmly believe that as the system is built out, trust will grow and responders and affected agencies will begin to see and hear positive things which will, in turn, result in a strong desire to take advantage of the capabilities of the system. Certainly, it is incumbent upon those currently using IM to actively support the system and help garner the positive outcomes we all seek to achieve.

Local Participation

Once a community has defined the level to which they want to use the IM locally, there are several paths they may follow. User involvement is a local decision but, as a general rule, the more one participates, the better their understanding, and ultimately, the better the outcome. The IM project includes several layers of user participation including local consortia meetings, weekly technical committee conference calls, and monthly Project Di-

rectors meetings in Helena. All are open and participation is encouraged at all levels.

Users/agencies will most likely find that the more they plan to utilize the hybrid system, the more they will want to be involved in the individual subcommittees. The IM Technical Committee is where the bulk of the design decisions are made for the system. This committee meets weekly by phone and discusses site locations, network design, encryption, and frequency issues, and incorporates them into the overall system design.

Key to the success of the IM hybrid system is the acquisition of VHF frequencies for use at each site. For this to be successful, users should plan on providing some local frequencies to be used for this purpose. The availability of frequencies varies by population, geographic area and radio use. Local frequency sharing is critical for system build out and frequency acquisition has been a significant stumbling block to system expansion.

Education and Understanding

Interoperability Montana represents a new way of thinking about voice and data communication. As such, education is key to realistic expectations and sound implementation strategies. Communities that fully embrace and want to implement the trunked level of the IM system should strongly consider having an individual dedicated to the project. Local needs advocacy is critical and is usually best served through the continuity and understanding of a "dedicated" local communication manager. Duties of a local manager include, but are not limited to, local frequency allocation, partnership building with nontraditional users, and focusing on the intricacies of a new technology. Additionally, the positive and negative impacts of the decisions made at the technical level and those of a political nature both require local input to ensure decisions meet local needs.

Once the system backbone is in place, local users will go through a communication

planning process commonly referred to as business practices and fleet mapping. Trunking is different than conventional radio, and proper utilization requires good planning. Fleet mapping determines and defines talk groups and how they integrate with each other and legacy communications systems as well as how users will employ encryption and wide-area coverage.

System Enhancements

The IM system has several important features not commonly seen in traditional conventional voice systems. Many of these features will enhance operability, some are optional, but all require planning to be used most efficiently and effectively. The Public Safety Services Office can provide important help as you think about your communications future. Historically, Montana public safety agencies have not had access to functionality like channel encryption, unlimited talk groups, emergency “man down buttons” or the ability to shut a radio off if lost or stolen. Additionally, operational issues such as simultaneous transmitting (cancelling each other out), or radios keyed open blocking any other users from using the system will become a thing of the past.

An important enhancement of the new system is the additional coverage it can bring to a local community. Agencies that traditionally communicate on one repeater (typically located on the highest mountain) can now have the ability to access several sites giving them coverage in areas they may not have had in the past. Increasing the density of transmitter sites will allow urban areas to have communications inside structures they may not have had in the past.

Gallatin County is looking forward to testing the system in a setting where some agencies are planning on joining immediately and others are not. This type of emergency response environment will clearly show how users utilizing different communications sys-

tems can work together under the Interoperability Montana model. We are looking forward to participating in this real life demonstration showing how phasing in different disciplines and agencies at different times will work in a real environment without losing any of the interoperability we all enjoy today.

In a perfect world, Interoperability Montana would be able to implement the hybrid system in much the same way Lewis and Clark County did. Unfortunately, no one showed up with a big blank check, and we will have to build the system out in phases. Certainly this brings new challenges, but it can (and is) being done. As in most things, it will require teamwork, compromise and a willingness to step up and work hard. The areas that want it the most are usually the best candidates for build out. No one wants to force this upon anyone who doesn't have a real interest in participating.

The layered radio network envisioned in Interoperability Montana may not be a one-size-fits-all solution to all of Montana's varied radio and data communication challenges. It is however, at least in our estimation, a giant leap in the right direction and can provide important communication tools that will help strengthen an already strong operational relationship between Montana's emergency responders.

*Jason Shrauger is the Gallatin County
Emergency Manager and Project Director of the
South Central Montana Interoperability Consortium.*



Technical Issues **By Don Brostrom,**

Background

The Interoperability Montana Project Directors (IMPD) has two committees reporting to it: The Interoperability Montana Governance Committee (IMGC) to define the short and long-term governance of the IM system, and due to the highly technical nature of interoperable radio communications, the Interoperability Montana Technical Committee (IMTC). The IMTC is tasked with overseeing the design and technical definition of the IM system.

The IMTC serves an important role in evaluating technology, determining technical specifications for equipment and sites, assessing communications sites, identifying and licensing frequencies, ensuring compliance with P25 standards, and addressing encryption and bandwidth issues. The IMTC has formulated technical criteria that have been used to prepare a prioritized list of infrastructure projects, which the IMPD has adopted.

The IMTC is made up of technical representatives from each of the nine consortia that make up the IMPD. Collectively they represent some of the best radio minds in the state of Montana and bring a wealth of local knowledge of wireless communications throughout the state. This expert group meets weekly via telephone and conducts monthly face-to-face meetings. Subcommittees of the IMTC include:

- Frequency Planning, Acquisition and Licensing
- Microwave and Radio Network Design
- Radio Unit Encryption
- Dispatch Connectivity

Ultimately, the IM Project will provide advanced channel management for the shared use of frequencies, seamless roaming, and enhanced responder safety through embedded signaling, while at the same time enhancing interoperable communication with existing legacy VHF

The IMTC is made up of technical representatives from each of the nine consortia that make up the IMPD. Collectively they represent some of the best radio minds in the state of Montana and bring a wealth of local knowledge of wireless communications throughout the state.

radios. This approach will allow public safety responders in Montana to exchange voice and data communications on demand and in real time during emergencies and disasters.

Technology

The IM system is being designed and implemented in accordance with the SIEC technical standard adopted in June of 2004 (http://siec.mt.gov/docs/SIEC_I_O_Def_tech_req.doc). This technical standard guides the definition of the IM system to become:

- A standards-based shared system of systems,
- A wide area system,
- Utilizing P25 trunked and P25 digital / analog conventional technologies,
- Providing interoperability among P25 narrowband digital trunked and existing conventional users,
- Seamlessly integrating with infrastructure equipment deployed in CDP 1 - Southwest Interoperability Project and CDP2 - Northern Tier Interoperability Project,
- Operating in the VHF frequency range,
- Connected by high-capacity digital microwave backbone for voice and data interconnect traffic,
- Providing advanced channel management for the shared use of frequencies,
- Providing seamless roaming throughout the respective trunked areas (footprint)
- Providing enhanced responder safety through embedded signaling,
- Providing enhanced interoperable communication with existing legacy VHF radios,
- Integrating with the current mutual aid channels.

Trunking – Trunked radios have a well-established foundation in public safety communications and is the technology in use or under development by many of the states and provinces neighboring Montana and through-

out our region. Trunking brings two primary strengths to public safety communications: seamless roaming within the trunked footprint, and dynamic channel management among radio users. Both of these are made possible by connecting trunked radio sites to the master control site, which oversees and coordinates both radio and dispatch communications.

Interoperable Repeater – Each trunked radio site within the IM system has one interoperable repeater that is tied into the system. This repeater operates in the VHF spectrum and in both analog and digital modes. The interoperable repeater serves mutual aid responders that do not have equipment capable of operating on the trunked system. It's configured such that it can be incorporated into an Incident Communications Plan as either a tactical repeater or as a gateway between conventional analog or digital radios and the trunked system.

Digital Microwave – A key component in both trunked radio communication and mobile data is connectivity through a high-speed, high-capacity digital microwave backbone. The IM network is designed to carry voice and data throughout the state utilizing current technologies while remaining positioned for future IP-based communications.

Coverage – Before responders can be interoperable, they must first be operable. A large part of operability is the selection of radio sites that provide adequate coverage for mobile, portable, and data communications. The IMTC works with local agencies and leverages local knowledge in selection of radio sites that provide superior coverage over a wide geographic area and is on or can be incorporated into the microwave backbone for trunked traffic.

Frequencies – Because of the characteristics

of the VHF frequency band over large, mountainous areas and the mix of local, state and federal responders who must communicate throughout Montana on a daily basis, the IM project is being developed utilizing the VHF spectrum.

Standards – The IMTC has developed and maintains a document of Best Practices which provides standards and guidance as the project moves forward. Examples include grounding standards, shelter and tower specifications, power and backup power requirements, and future growth.

Infrastructure – Sites that are incorporated into the IM system are brought to the strictest standard of communications. The sites are grounded according to the R-56 standard. The shelters are OSHA compliant and physically secure with multiple alarms in place. The power is backed up with an appropriately sized generator designed to operate in the extreme conditions inherent in the mountaintop sites throughout Montana. The towers are designed to accommodate high winds and icing conditions. The overall design of each site allows for foreseeable future growth.

Encryption – Certain public safety responders require the ability to conduct secure communications, either for responder safety or as required by HIPAA. The IMTC has developed standards to address encryption at the local, regional and statewide level, for both interagency use and mutual aid.

The Future

The only constant in technology is that it's forever changing. Public safety communication continues to evolve at the local, state and federal levels. On the horizon are IP-based radios and software controlled radios; 700 Mhz and broadband mobile data; regional and national mutual aid plans. Throughout it all though, the mission of the IMTC will remain the same: improve communications for the responder on the ground to improve their safety and their ability to serve the public.

***Don Brostrom is the Hill County Undersheriff and
Chair of the Interoperability Montana Technical Committee***



Strategy for Support of the Interoperability Montana Communications Project By Dick Clark

A Recent History of the Montana Wide Communications Interoperability

The SIEC Vision of Interoperability Montana is that local, state, tribal, federal, multi-state regional, and international public safety responders have the capability to use seamless voice and data communications when responding to an incident or disaster.

After every multi-jurisdictional incident such as Hurricane Katrina and 9/11 in New York City, the first item noted by “reviewers” was that public safety responders did not have interoperable communications, at any level, to seamlessly share voice and data with one another to coordinate their activities. The reasons for not having interoperable communications were: aging and incompatible equipment, limited and fractured funding, limited and fragmented planning, lack of coordination and cooperation, and limited and fragmented radio frequency spectrum.

To remedy the problem, the Department of Homeland Security, Science and Technology Directorate’s Office for Interoperability and Compatibility Program (OIC) published written guidance in the form of the SAFECOM Continuum for establishment of interoperable communications.

The SAFECOM Continuum establishes criteria for Federal Grant funding. Montana uses the SAFECOM Continuum as the standard for establishing and evaluating the progress of interoperable communications in Montana. To meet the SAFECOM guidelines, the Governor approved the Montana Homeland Security Strategic Plan (MHSSP) in which Interoperable Communications is the number two priority and established the Statewide Interoperability Executive Council (SIEC) by Executive Order.

SIEC’s mission is to assist the Interoperability Montana Project Directors Board (IMPD) to meet the requirements of the MHSSP by developing recommendations for legislation, developing information and funding streams from external sources, establishing interoperability communications standards and policies for Montana, and assessing the benefits of new communications technologies.

Interoperability Montana (IM), is a Montana-wide, standards based voice and data interoperable communication system designed to provide seamless voice and data communications to local, state, tribal, and federal public safety responders within Mon-

tana. The IMPD is composed of representatives of the eight voice and one mobile data consortium. Each consortium includes representatives of the local, state, tribal, and federal public safety responders within the region.

SIEC Vision and Mission to Support Interoperability Montana

The SIEC Vision of Interoperability Montana is that local, state, tribal, federal, multi-state regional, and international public safety responders have the capability to use seamless voice and data communications when responding to an incident or disaster. The SIEC Mission is to assist the IMPD in their mission of creating Interoperability Montana (IM), a Montana-wide, communication system for all emergency response elements to protect the citizens of Montana and the United States within both SAFECOM guidance and the MHSSP objectives .

SIEC Strategy to Support Interoperability Montana

SAFECOM Continuum guidance establishes the areas of governance, standard operating procedures, technology, training and exercises, and usage as inter-locking components of an architecture that is achievable to develop an optimum level of communications.

MSSHP objective number two directs the development of a statewide interoperable public safety radio communications plan that incorporates federal guidelines, deploy concept demonstration plans, and continue to plan, assist and implement public safety communications.

The previous SIEC Board concentrated on advancing MHSSP, in consonance with SAFECOM guidance, by focusing on governance, deploying concept demonstration plans, and assisting the implementation of public

safety communications. The SIEC has been reformatted and streamlined. The current board is composed of ten voting members representing local jurisdictions and ten non-voting members representing state agencies. The local jurisdiction representation is critical to the entire project because IM is a “grass roots” project. Among the voting members is the IMPD chairperson who is charged with presenting all requests for assistance to the SIEC board for approval

The current SIEC board continues to strengthen governance, and the implementation of public safety radio communications throughout Montana. In addition the current board is charged, by Executive Order, to develop parallel gateways to assist the IMPD. The SIEC requirement to assist the IMPD is greatly assisted by the fact that ten state agencies serve on the SIEC. During a SIEC meeting there is the capability of presentation of an IMPD issue and “instant” resolution based on an agency capability. While this is not a strategy, the “issue resolution capability” is very helpful. The deep seated SIEC strategy is to develop the status of “pilot program” for the IM network in Montana. This fulfills the charter of assisting the IMPD because it eliminates the yearly need to develop funding for what amounts to another portion of the network and would allow the IMPD to approach the development of the network as a complete system.

The completion of the overall SIEC strategy involves the creation and development of partnerships with local, state, tribal and federal agencies. These agencies contribute to the development of the overall network through their individual efforts which contributes to the “proof of concept” of the system allowing further development. The most striking success of the strategy of partnership development, to date, is with state and federal agencies.

At the local level SIEC support agencies have developed partnerships with the agen-

cies responsible for the development of lease agreements, infrastructure planning, and coverage areas. Additionally this has led to an extensive outreach program to educate the local jurisdictions on the full extent of IM.

At the state level, the SIEC, enhanced by gubernatorial efforts, was able to involve state agencies to complete an interoperable communications system assessment which further led to state agencies' active participation and assistance to the IMPD. As a result of these efforts the Department of Transportation, Department of Natural Resources & Conservation and Montana Highway Patrol have become full, participatory members of the IMPD. Additionally the Department of Military Affairs, Montana National Guard has contributed to the overall system with network design expertise and integration of infrastructure to build out the system. Additionally, the legislature has provided support to the IM network through apportionment of funding for infrastructure and build out of the IM network

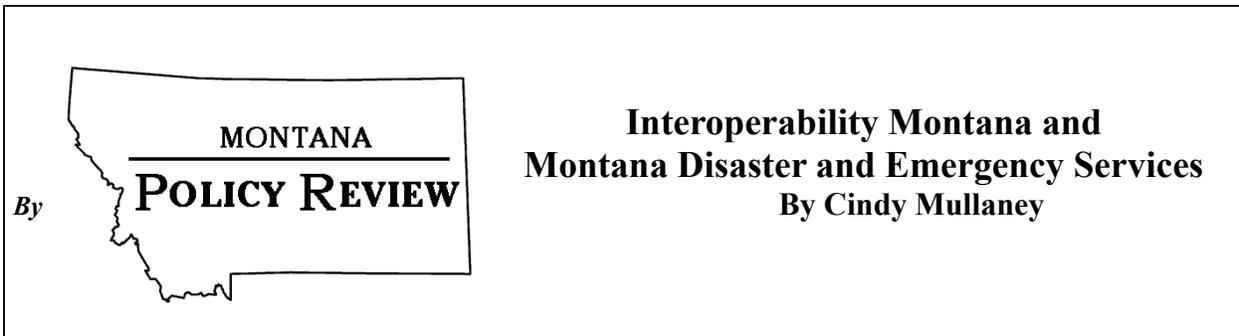
At the tribal level partnerships have been developed for tribal specific communications sites and for interagency development of communications sites between the tribal and federal agencies. At the federal level there have been many successful examples of partnership development which have assisted the IMPD. At this time the Department of Interior has completed a Memorandum of Agreement with the State of Montana to provide an equal share, no cost, use of infrastructure and frequencies. To date this has resulted in the IM communication site lease being completed on a priority basis. Additionally, the Department has licensed federal frequencies for use by the IM system. Also at the federal level, the SIEC support agencies are working with the Department of Defense, National Guard Bureau to obtain interoperable public safety frequencies to assist in the build out of the system.

While these partnerships provide for the

additional build out of the system, just as importantly, there are partnerships which allow the IM project to closely coordinate with different agencies involved to insure mutual needs are satisfied without conflict. As an example the SIEC support agencies have developed a partnership with the Western Border Interoperability Working Group which involves local, state, tribal, federal, regional western states, and Canadian government agencies to develop a comprehensive interoperable communications network.

The SIEC and the support agencies continue to develop partnerships which will lead to implementation of a fully funded interoperable communications, pilot program in Montana that has the capability to provide seamless voice and data communications within Montana and will also be fully capable of integration of regional and international partners.

Dick Clark is the Montana Information Technology Service Division Chief Information Officer



With the technology advancements inherent in the Interoperability Montana Project, the reinforcement of existing relationships and the development of new ones, public safety in Montana has taken a major leap forward.

Incidents happen at the local/tribal level and it is the responsibility of local/tribal jurisdictions to respond to and manage those incidents. Local/tribal emergency managers are tasked with coordination of the plans, policies, procedures and resources needed to respond to those incidents. In addition, they are responsible, in large part, for the coordination and/or development of annual exercises to test local capabilities.

In most incidents and exercises, one issue, nearly always identified as needing improvement, is communication. In some cases, the issue is the ability to communicate with response agencies from within your jurisdiction. For example, one agency may use a UHF or 800 MHz system, while other agencies in that same jurisdiction use a VHF system. This is the same issue that resulted in the deaths of so many firemen during the September 11th attacks. In other instances, the issue is the ability to communicate with agencies from outside your jurisdiction – local, tribal, state or federal.

As identified in the National Strategy for Homeland Security, the challenge in securing the nation from terrorist attacks is to develop interconnected and complementary systems that are reinforcing rather than duplicative and that ensure essential requirements are met. Because of their coordination responsibilities, local/tribal emergency managers became the point of contact for the Homeland Security Assessment and Strategy Program. This program was designed to assess threats, vulnerabilities, capabilities, and needs related to preparedness for weapons of mass destruction terrorism incidents at the state, tribal and local levels.

Initially, grant funding from the Department of Homeland Security was allocated by the State Administering Agency (SAA) to the counties/tribes. The local jurisdiction could then decide how this funding would enhance local/tribal capabilities in response to a terrorism incident, within the parameters identified by the grant. Many local/tribal jurisdictions began the process of upgrading radios and related equipment with this funding. Concept Demonstration Projects I (Lewis & Clark County) and II (Northern Tier) came into being as grassroots interoperability communication

projects designed not only to improve communications locally, but also to develop an interconnected system.

With the success of these projects, counties/ tribes formed into nine consortia, with the intent of developing a statewide interoperable communications network. Grant funding was allocated to support the consortium rather than individual counties and tribes. County/tribal leadership appointed a primary and an alternate representative to serve as consortium members. The consortium members then elected a project director as the chief executive officer of the consortium, responsible for day-to-day operations and to provide coordination between the nine Consortia, SAA, Project Directors Board, Department of Administration and the contractors engaged in the design, management, and deployment of the project.

Emergency managers are working diligently at making this project a success. Four of the nine project directors and many of the Consortia Board members are emergency managers. In the Central Montana Consortium, for instance, the primary or alternate board member for the seven jurisdictions is the emergency manager. Others serve as members of the Interoperability Montana Technical Committee, while others provide support to the project by helping coordinate and gather local information needed for the statewide project.

Grant funding is now allocated for the project, rather than the consortia. These changes – local jurisdiction to consortia to the project – have brought about a major change in the mindset we have all used for many years. Rather than thinking of our own needs, or the needs of the individual consortia, we have made the leap to thinking in more global terms.

We have learned that in order to receive, we have to give. We have developed relationships not only with the members of our individual consortium but also with those of

other consortia and with state agencies. We have developed relationships with several federal agencies and will continue to expand both the federal and state groups as the project expands. We are in the process of building relationships with states contiguous to Montana as well as Canadian provinces.

Interoperability refers to the ability of public safety emergency responders to work seamlessly without any special effort. Wireless communications interoperability specifically refers to the ability of public safety officials to share information via voice and data signals on demand, in real time and when needed. Communications interoperability also makes it possible for public safety agencies responding to catastrophic accidents or disasters to work effectively together. It allows public safety personnel to maximize resources in planning for major predictable events or for disaster response and recovery efforts. With the technology advancements inherent in the Interoperability Montana Project, the reinforcement of existing relationships and the development of new ones, public safety in Montana has taken a major leap forward.

Cindy Mullaney is the Central Montana Interoperability Consortium Project Director and the Pondera County Disaster and Emergency Services Director



Emergency Medical Services By Carole Raymond

Rosebud County is ready to take the radio system to the next step. The infrastructure necessary to proceed exists and all that is needed are subscriber units to finish the project.

With the implementation of the IM project, a giant step forward for communication in emergency services operations will be achieved. First and foremost would be access to encrypted radios by EMS providers. With the new rules in patient privacy, it is vital to keep communication secure, but how can an emergency responder tell the receiving hospital what is in transit to them without violating this requirement? Cell phones have been used in the past, but this really is not a secure way to transmit sensitive information.

Rosebud County has a critical access hospital but it is small. There is one nurse on duty at night and the doctors are not always in the hospital, nor are lab technicians and x-ray technicians always available. It is vital to be able to give the hospital as much time as possible to contact extra help prior to the arrival of several ambulances with multiple patients. This is very typical of the smaller community hospitals. Limited resources are available but being able to communicate is imperative to improve patient outcome.

Rosebud County has three ambulance services because it is a very large county. There is an ambulance service in Forsyth and Colstrip. The town of Ashland has a quick response unit at the very corner of Rosebud County. Being a quick response unit means that they stabilize the patient until a transporting ambulance comes. They are not allowed to transport except in very critical situations. They have to be able to communicate and cell phone coverage is non-existent in southern Rosebud County and radio communication is poor at best.

A small volunteer ambulance service offers paramedic services in the county. It covers a large rural area where cell phone and radio communication is often very difficult. Rosebud County is ready to take the radio system to the next step. The infrastructure necessary to proceed exists and all that is needed are subscriber units to finish the project. It is very fortunate that Rosebud County is at this stage; this is the very rare exception. Most counties are not anywhere at this level of development. Still, better communication needs to be developed. Montana is a frontier with

fewer than six people per square mile. It is vital for emergency responders to be able to talk to medical control at all times; it can make the difference between life and death. The ambulance can travel as long as an hour before even reaching the scene. As far as responders have to travel, the roads are often graveled and sometimes they are dirt tracks. The driver needs to be able to use the radio without having to search for the right repeater and sometimes might not have coverage.

Responders need to talk to whomever they need without effort. If EMTs are unable to give pain relief because they cannot contact medical control, it is a terrible disservice to the patient. The hospital has patient charts that are not available to the ambulance crew but could be relayed to responders in the field if they are able to talk directly to the hospital. If the patient is unconscious, very young, or confused and unable to give a reliable history, a wrong drug could easily be given with a very unfortunate outcome.

Rosebud County’s biggest concern for disasters is floods and wildland fires. Communicating during a flood is very important as well as during fires because they can cover a large area in a very short time. Emergency personnel need to be able to communicate without having to try to find a repeater that will work. These situations do not follow the interstate highway. Rescuing people can be very difficult at best but when a responder cannot talk to anyone, it makes it impossible.

Several Rosebud County EMS personnel have been trained to the paramedic level. They spent three years traveling 160 miles for every class. This was done on a volunteer basis and without compensation. They did it because they wanted to provide the best health care possible for our patients. Now there is an opportunity to be able to do even more for rural Montana – to develop the very best communication capabilities possible.

Carole Raymond is Rosebud County’s Disaster and Emergency Services Coordinator.

**Montana Population Facts
Of Montana’s 129
Municipal Governments:**

- **73 municipalities have fewer than 1000 residents**
- **47 municipalities have fewer than 500 residents**
- **Five municipalities have fewer than 100 residents**
- **One municipality (Ismay) has 25 residents**



Tribal Participation **By Jolene Jacobson**

Tribal nations play an important role in interoperable communications throughout Montana. In particular, four tribes on Montana's 565-mile border with Canada have been actively participating with the Northern Tier Interoperability Project. These include the Blackfeet, Confederated Salish Kootenai Tribes (CSKT), Fort Belknap, and Fort Peck Indian Nations. On May 26, 2004, each tribe signed letters of intent to join the Northern Tier Interoperability Consortium to set the basic framework for providing secure communication capability between federal, state, local and tribal law enforcement agencies.

This type of tribal collaboration is precedent-setting because Indian Nations are sovereign nations, meaning, in the words of the U.S. Supreme Court, they are "domestic dependent nations," which exercise inherent sovereign authority over their members and territories. Tribal nations have the right to petition the federal government for their own Homeland Security funding. Instead, they chose to partner with the Northern Tier Interoperability Project because of mutual and critical communications interoperability needs between levels of government and across jurisdictions.

Linda Weeks, an Environmental Specialist who works with Fort Peck Tribal Emergency Response in Poplar, MT emphasized the significance of being the first tribe in Montana to sign a Memorandum of Understanding to participate on an interoperability consortium.

"That was a huge step," she said. "Now, we have much better radio coverage in our outlying areas. Our reservation consists of two million acres, so that's a lot of territory to cover," said Weeks. The Northern Tier radio system will provide advanced digital, secure voice and data communications for law enforcement interoperability across this vital border region. It also will improve homeland security by providing the means for military and civil authorities to communicate by radio.

This partnership has already yielded positive results, even though the Northern Tier project isn't complete yet. For example, in my region, the new communications site on Jette Mountain resides on tribal land, and the Confederated Salish Kootenai Tribes serves as the site manager. Our tribe was instrumental in assisting with all phases of the construction process to help move the project forward and to get the site built. As a result of this involvement, the CSKT has experienced dramatic improvements in our radio communications.

"I'm thankful that we've been able to participate," said Donald Bell, a patrol officer on the CSK Tribal Law and Order Police Force, located in Pablo, MT. "The coverage we now have is unbelievable. Previously, we could not communicate on the west side of the reservation, and we had no radio coverage in Arlee, MT, a town just 22 miles away from Missoula, Montana's second-largest city. The coverage footprints between the old and new sites clearly show great improvement."

Bell serves on Montana's Homeland Security Task Force and was appointed by the U.S. Attorney General to the U.S. Anti-Terrorism Advisory Council. He said it has been great participating with other law enforcement officers and DES coordinators on the Northern Tier Interoperability Project, and he has been impressed with everyone's professionalism and ability to cooperate to help improve public safety.

In addition to technical expertise, the Fort Belknap Tribal Nation has been instrumental in contributing cultural and spiritual advice. According to Janice Hawley, the Human Resources Manager for the Fort Belknap tribe, who also serves on the Northern Tier board of directors, tribal members were actively involved in performing a cultural assessment of the Mt. Royale Site. This assessment was conducted to determine if placement of the tower and radio equipment would have a detrimental impact on any of the tribes' spiritual sites on and around the mountain. Fortunately, it was determined that the communications site would not have an adverse affect, so construction could proceed.

"Tribal members were instrumental in facilitating the cultural assessment," said Hawley, and "I'm pleased that we were able to be so actively involved." In addition, Hawley points out a benefit of regular communication and participation on the Northern Tier project. "As an active participant at board meetings, our tribal law enforcement is able to readily coordinate efforts with law enforcement officers from other jurisdictions. This opportunity to network is invaluable," she said.

Nora Kennedy, Blackfeet Emergency Medical Services, also has positive things to say about their involvement with the Northern Tier. The cooperation between the Blackfeet Tribal Nation, Glacier National Park, and the Interoperability Montana Project is unprecedented in the area of mutual benefit and planning. The Divide Mountain radio com-

munications site is located on tribal lands and Glacier National Park has agreed to build it for mutual use of the Northern Tier, the Blackfeet Tribe, the Park Service and other Federal and state users.

Seven of Montana's tribal nations participate in the Interoperability Montana project across the state. Indian Nations represented in three consortia are as follows:

**Big Sky 11 Interoperability
Communications Consortium (Big Sky 11)**

- Crow Tribe
- Northern Cheyenne Tribe

**Central Montana Interoperability
Communications Consortium (CMICC)**

- Rocky Boy's Indian Nation, home to the Chippewa-Cree Tribe

**Northern Tier Interoperability
Consortium (NTIC)**

- Blackfeet Tribe
- The Flathead Indian Nation, home to the Confederated Salish Kootenai Tribes
- Fort Belknap Indian Nation
- Fort Peck Indian Nation

Jolene Jacobson is a member of the Confederated Salish Kootenai Tribes and Tribal Emergency Response Commission.



**Montana Interoperability Project:
A Perspective
By Donita Demontiney**

Radio services for our area will improve with the new radio systems, and repeaters will aid those areas where there has never been radio coverage before.

The Chippewa-Cree Tribe became a member of the Central Montana Interoperability Communications Consortium (CMICC) in 2004 after a long debate with the tribal council as to why it would be advantageous to our tribe to participate in this endeavor. After the initial assessment of radio coverage for our land base, it became apparent that the development of the interoperability infrastructure utilizing Centennial Mountain would be beneficial for all of the consortia, and it would greatly improve the overall coverage of our land base since most of the area consists of deep ravines and valleys. The proposed project is to develop Centennial because it is the highest area in north central Montana and has been previously used for communications efforts, so it has the proven record for effectiveness.

The initial assessment also showed that development of Centennial Mountain will allow for radio communications deep within the Choteau County area and improve services for the City of Fort Benton that lies in the Missouri River valley. Radio services for our area will improve with the new radio systems, and repeaters will aid those areas where there has never been radio coverage before. This will improve communications efforts in emergency situations such as search and rescue and fire suppression as well as maintain security in the event of terrorism threats.

The downside to interoperability is the cost of new P-25 system radios and other equipment needed to upgrade the system. Most tribes do not have the finances to purchase the equipment, and they rely solely on the state for funding. As this project develops throughout the nation, it is hoped that funding will be more widely available.

The Chippewa-Cree gains positive recognition by its participation in a project that ultimately stretches across the nation.

***Donita is a member of the Chippewa-Cree Tribe
and the Central Montana Interoperability Consortium.***



**Public Safety Communications
Interoperability and
Federal Partnerships
By Chris Lewis**

Department of the Interior Mission

The Department of the Interior (DOI) is the nation's principal conservation agency. Our mission is to protect America's treasures for future generations, provide access to our nation's natural and cultural heritage, offer recreation opportunities, honor our trust responsibilities to American Indians and Alaska Natives and our responsibilities to island communities, conduct scientific research, provide wise stewardship of energy and mineral resources, foster sound use of land and water resources, and conserve and protect fish and wildlife. The work that we do affects the lives of millions of people, from the family taking a vacation in one of our national parks to the children studying in one of our Indian schools.

Addressing Public Safety Communications Interoperability and Federal Partnerships

When local, tribal, state, and federal agencies need to work together, whether to put out a fire, find a lost child, protect our borders, or ensure the public stays safe, they must communicate. This is easy enough if you're looking each other in the face, but not so easy if you are each using radio systems in different parts of the radio frequency spectrum (think AM versus FM radio), or using systems which operate differently, even though in the same radio spectrum (think of having an analog TV and not being able to watch digital shows). These are what we term "disparate" systems. The most common form of public safety radio communications uses Land Mobile Radio (LMR) systems.

The ability to find a solution, or set of solutions, to allow disparate LMR systems to work together, or combine these systems, or other concepts so communication can take place, or interoperate, is called "interoperability".

Local, tribal, state and federal public safety agencies, desiring to work together (cooperate), have always had to find ways to interoperate. To achieve adequate communications, processes, procedures and protocols, whether formal or by "handshake" had to be agreed upon amongst all of the cooperators. These interoperability agreements covered a multitude of solutions, including swapping radios, providing radios from one central system to all concerned, agreeing to use each other's radio frequency spectrum and, other solutions. These agreements, when properly practiced, allowed for disparate users of the radio frequency spectrum to interoperate.

Interoperability is not a new idea. The need and capabilities for public safety organizations to work and communicate together has been around since well before the Oklahoma City Bombing, 9/11, and Katrina. The DOI has been using radio systems to communicate with state, local, tribal and other federal agencies to support public safety missions for decades.

Harkening back to the early 1970's the Boise Interagency Fire Center, established by the

DOI and the U. S. Department of Agriculture, provided wildland fire fighting communications capability through use of radio systems deployed on wildland fire fighting missions. The use of a single set of systems for all fire fighters on a fire provided needed communications as required, thereby achieving “interoperability.” Now known as the National Interagency Fire Center (NIFC), with responsibilities for providing radio communications capabilities, for not only fire fighting efforts, but also natural and man-made disasters, NIFC continues to provide one of the foremost proven tactical, but temporary, solutions.

Radio communications has come a long way since the day when law enforcement officer, fire fighters and emergency medical services only had analog voice as their form of communicating. Today communications technologies can provide voice, data, video, paging, internet access, and a multitude of other capabilities. Many of these capabilities are only usable by one type of system, and therefore are “proprietary”. Though very beneficial to the user, proprietary systems have basically only two interoperability solutions. Either everyone uses the same manufacturer’s equipment, or other manufacturers must provide software or hardware add-ons to their equipment, which will allow access to the proprietary system. The use of proprietary systems narrows interoperability opportunities, and forces users to a specific type of system, and negates outside cooperators from participating.

The Association of Public Safety Communications Officials (APCO) Project 25, Telecommunications Industry Association (TIA) standard 102, provides for a set of non-proprietary standards for radio communications. This standard, normally called “P25” though based in a narrowband digital format, requires backwards capabilities to communicate with narrowband and wideband analog radios. Wideband defines the amount of the

radio frequency spectrum used on a single channel by a radio, and is greater than 12 ½ kilohertz. These channels are set up every 25 kilohertz throughout a range of frequency spectrum, normally called a band. Narrow-band channels use less than 12 ½ kilohertz of radio frequency spectrum. The channels can now be spaced every 12 ½ kilohertz, basically doubling the amount of available channels. This is called spectral efficiency. DOI LMR operations have been mandated to use P25 equipment since 1996.

The DOI, along with all other federal agencies, has been congressionally mandated since 1995 to achieve spectral efficiency through narrowbanding our use of the federal LMR spectrum. Federal agencies, for the most part, use the radio frequency band 162 – 174 megahertz, which is considered to be the Very High Frequency (VHF) spectrum range. This portion of the spectrum is under the management of the National Telecommunications and Information Administration (NTIA) and is predominantly for federal use only. State, Local, and many Tribal entities use the 150 – 162 megahertz band for their LMR operations. This portion of the spectrum is managed by the Federal Communications Commission (FCC) is predominantly for use by non-federal entities.

Until recently, non-federal users have not been authorized to use the federal spectrum unless to support all-risk-management actions such as sponsored by NIFC or on a case by case basis for mutual aide. Federal entities, needing access to non-federal cooperators radio systems, are required to register their use with the NTIA in the form of a radio frequency assignment (RFA) and have successful coordination comments from the FCC. DOI maintains almost 1400 of these RFAs and associated agreements due to the missions of the department and our need to consistently work with our state, local and tribal partners.

What are the DOI needs to achieve interoperability?

- DOI, managing one out of five acres in the United States, requires us to interoperate with a huge amount of state, local, tribal and federal public safety agencies. We share too many common missions to operate separately at all times.
- Federal and FCC LMR users have been mandated to achieve spectral efficiency through narrowbanding and we continue to update our stand-alone systems to meet his narrowband mandate.
- An open, non-proprietary standard must be used which will allow various wide-band and narrowband analog and digital users to “interoperate.”
- We need interoperability solutions to meet public safety missions.

DOI has formulated a strategic vision, which incorporates a paradigm shift in how interoperability can be achieved, to answer the above needs. Instead of maintaining separate, side-by-side systems with state, local, tribal and other federal agency LMR systems, our preferred method is to merge our LMR networks with other large area, state or regional, LMR networks. In order to achieve this integration, DOI’s paradigm shift is in providing access to DOI allotted federal radio frequency channels to FCC systems. Additionally, to increase availability of access to DOI managed lands, of course following Environmental Protection Agency cultural protection and other guidance, provide, where capable, additional technical assistance with system maintenance and growth, and provide local DOI personnel to state and regional committees, such as State Executive Interoperability Committees (SIEC).

The shift to inclusion of federal frequencies in state public safety systems is still an on-going process. It is anticipated NTIA and FCC will have further insights, requirements and protocols as this process matures. Cur-

rently, the DOI allotments in use in IM are on a temporary assignment basis until NTIA finishes certifying, through the Spectrum Planning Subcommittee process, federal spectrum participation. There is every reason for federal caution to ensure proper safeguards are in-place and followed to protect incursive, non-federal use of the NTIA managed spectrum. Though NTIA fully supports various interoperability solutions, and is amenable to the paradigm shift of using federal frequencies in a non-federal system, we must ensure this does not signal carte blanche access to private sector, commercial and other non-federal users.

DOI has specific requirements in this paradigm shift in our interoperability efforts:

- A signed Memorandum of Understanding (MOU) (or Agreement) (MOA) between the State and DOI. The agreement will be signed at a sufficiently high enough political or managerial level to ensure all participants are duly represented. DOI will sign at the Office of the Secretary National Level.
- The LMR system must adhere to the P25 standard.
- The system must allow end-to-end encryption for the use of the National Institute of Standards and Technology (NIST) Advanced Encryption System (AES) technology.
- In order to be able to provide access to DOI allotments in the federal radio frequency spectrum, the system must be capable of working in either the 162 – 174 megahertz or 406 – 420 megahertz ranges. DOI employees must be active participants in the system. We will not provide radio frequency access if DOI is not an active participant.
- System radio coverages must be at a minimum equivalent to, or preferred, improved over current DOI coverages.
- System redundancy, allowing for ade-

quate radio coverage in case of specific site loss, system recoverability in a timely manner, and resiliency during increased disaster efforts.

Additionally the following have been determined to be best practices:

- Use of trunking technology
- 24/7 public safety dispatch. This can be provided either by the system owner (state or regional), DOI, or combined
- Technical or project director committees where system configurations and technologies can be reviewed and changed to meet system needs. DOI should be a participant with these committees.
- If DOI provides spectrum access, which has been deemed to have considerable value and consistent increasing worth, DOI will not be charged system user fees.

Applicability to Interoperability Montana (IM) and the State of Montana

On October 6, 2006, W. Hord Tipton, DOI Chief Information Officer (CIO); Dick Clark, State of Montana CIO, ITSD- DOA; and Lewis and Clark County Sheriff Cheryl Liedle, representing the Interoperability Montana (IM) Project Directors, signed an agreement for DOI to join their P25 VHF Trunked Public Safety LMR system. This provides an overarching agreement to all DOI agencies and allows them to work with state, local, Tribal and federal agencies operating in Montana, knowing the departmental leadership supports and encourages their efforts.

Though IM is still being built, the basis of the system meets DOI requirements, and exemplifies the type of interoperability solution which meets not only DOI, but local, tribal, state and federal interoperability needs.

DOI has been a partner in Montana public safety for decades, but until the signing of the

agreement, and the gradual migration of DOI missions to IM, all concerned continued to maintain their side-by-side LMR systems, with the use of dozens of local MOUs to reflect our working relationships.

This cooperative partnership meets and exceeds the stated interoperability needs stated above:

- It provides for interoperable LMR communications with Montana state, local and tribal agencies
- Using narrowband technologies, the system achieves mandated spectral efficiency
- Using P25 technologies ensures the system has an open architecture and is non-proprietary, allowing interoperability with analog wideband and narrowband user.

This is an impressive interoperability solution

DOI is very pleased with our partnership with Montana. The IM, as it matures, will meet or exceed DOI interoperability requirements, while at the same time allowing DOI to migrate from the majority of our own LMR networks. The final outcome allows unimpaired voice and data communications with our cooperative partners, and also saves the taxpayer significant amounts of money to maintain non-interoperable networks. We see our partnership with IM, and in fact with many other states, as a significant and realistic solution to public safety interoperability needs. The ability for state, local, tribal and federal public safety entities to communicate is imperative and driven from the highest levels in government, and more importantly, from the needs of and for, the public.

Chris Lewis is the Public Safety Communications Program Manager at the U.S. Department of the Interior

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