

Appendix I

Analysis of PSMC Efforts in Neighboring States

Interoperating with States Surrounding the State of Wyoming

The six states surrounding Wyoming are Colorado, Utah, Idaho, Montana, South Dakota and Nebraska. Each of these states either has a statewide radio system or has a plan in place to develop a statewide radio system. Each state is in a different position in the implementation phase of their respective systems. All six of these systems are discussed briefly below. All states interviewed expressed interest in and attributed value to the ability to interoperate with the State of Wyoming.

Colorado

The State of Colorado has been working toward a statewide digital trunked radio system since 1991. In 1999, a contract with Motorola was signed to start work on the state's Project 25 compliant 800 MHz SmartZone trunked system. The system has been divided into seven phases over a seven-year span. Currently, the first four phases have been completed; the remaining three are contingent on funding. Based on the cost of current phases, the estimated cost of this system is approximately \$76 million. The project boasts more than 35 counties, cities, and local agencies participating in the system. Beta testing of the state's voice-over-Internet-Protocol (VoIP) system was scheduled to begin in 2002. Phase I in '98-'99 involved the deployment of digital trunked radio equipment in part of the metro-Denver area. Phase II in '99-'00 implemented radio equipment in the remainder of the metro-Denver area. Phase III in 2000-01 deployed equipment in northeastern Colorado and the eastern plains, and Phase IV in 2001-02 involved the deployment of equipment in southeastern Colorado. Phase V is planned to install equipment in northwestern Colorado and Phase VI is proposed to deploy equipment in southwestern Colorado. Finally, Phase VII is planned to install equipment in south central Colorado which will complete the overall coverage across the State. The primary constraint for deployment for the system is the availability of funding. It is estimated that 63% of the population of the state is covered by the new system as of November 2003, and 75% will be covered by the end of 1Q2004. It is not known when the rest of the state will receive coverage. Thus, the legacy VHF systems that are in place today will continue to be used until funding is available for them to transition. They plan on using their existing patching systems, sharing of radios, and some use of mutual aid channels to interoperate within the state until all systems have transitioned.

State radio users in the northwest part of Colorado currently operate on a VHF analog conventional system. Phase III covers part of the Wyoming border and it is already deployed and running. Phase V, which also covers part of the Wyoming border, will begin construction in the summer of 2004 and will be completed by the summer of 2005.

Colorado plans to integrate data into their P25 system by the summer of 2004. Voice is the primary priority at this point, although data will be implemented across the state within

the next few years.

There is a statewide users group that helps determine funding priorities and shares experiences across the various agencies and municipalities in the State. Colorado plans on approaching the issue of interoperability with Wyoming once the final technology plan for Wyoming has been determined. Colorado was hoping that Wyoming would choose a compatible 800 MHz system, but if another system is chosen, the interoperability strategy will be more complex. Colorado feels that law enforcement and first responders voice are the primary priorities for establishing interoperability. Colorado currently limits the use of cross-band repeaters for establishing interoperability either within the state during transition, or with other states, until after full deployment of the Colorado system. In the short term, they plan on continuing the approach of sharing radios and dispatch-center patching to interoperate with Wyoming.

South Dakota

South Dakota is presently operating a Motorola 4.1 SmartZone trunked radio system on VHF high band. The radio systems are P25 compatible but the trunking is not. Encryption is not deployed at this time. This system links all state agencies, all county agencies, and all municipalities, with the exception of some campus facilities that don't have a need to interoperate with the other agencies in the state. It is funded 100% by the state. South Dakota is in the process of implementing a separate VHF high band mobile data system. The mobile data system will be completed by the end of 2004.

South Dakota plans on developing an interoperability approach with Wyoming once Wyoming has made a final technology selection. They feel that voice communications is the priority, and plans on using mutual aid channels, based on Federal standards, wherever they can to improve the amount of interoperability.

Utah

Utah uses a Motorola 800 MHz Astro/Smartzone 4.1 mixed mode OMNILINKED system which is installed in eight counties primarily around Salt Lake City: Weber, Davis, Tooele, Salt Lake, Summit, Wasatche, Utah, and Morgan. Eighty percent of Cache County is also covered by the system. The system is dual mode with a 3600 baud control channel, and the trunking is not P25 at this time. The rest of the state uses VHF analog conventional base stations.

With the exception of some local agencies in Utah County, all state and local public safety agencies within the eight counties with the Motorola dual mode system are on the system. All public safety agencies outside the eight counties have access to Utah's VHF

conventional channels.

The Motorola mixed mode system is the only system to be implemented at the present time. Utah will add approximately thirty 800 MHz conventional base stations at the VHF sites and tie them into the Motorola Astro/Smartzone system. Utah wants to add 800 MHz trunked coverage along the Interstate 15 corridor throughout the state.

Consoles in selected rural communities will be connected to the network by microwave allowing patch capability to VHF systems to be accomplished. They are also locating standalone 800 MHz transmitters in strategic rural locations tied to the local dispatch centers for interoperability with 800 MHz users as they travel the state. UCAN currently serve 109 separate governmental bodies with communications.

The State of Utah formed the Utah Communications Agency Network (UCAN) as a quasi-state agency serving as a board of directors for the development of a public safety communications system. In response to the financial restrictions imposed on some of the more than 55 participants, the system offers both analog and digital capabilities. UCAN is the radio infrastructure provider; dispatch centers remain under existing management structures. The backbone system is provided by the state and is funded through user fees; subscriber equipment is funded by the agencies and municipalities. Natural consolidations have taken place on a regional basis with shared central electronics and shared networks such as T-1, microwave, and fiber. A task force is in place to consider Utah's mobile data options. Individual agencies may decide to lease time on a provider's infrastructure.

The Technical Steering Committee of the Utah Wireless Integrated Network (UWIN) has established a committee to evaluate and recommend a plan, time lines, etc to accomplish VHF narrowbanding within the State of Utah. This committee will report the plans to accomplish this task to the Technical Steering Committee who will report to the Governance Board. UWIN's mission is to plan for and foster coordination and integration among wireless networks on a statewide basis that meet the requirements of local, state, and federal public safety and other state agency needs.

The state of Utah is interested in having mutually beneficial interoperability with the state of Wyoming and have had some early discussions regarding the Livingston Butte area. Utah's preference for interoperability is primarily for voice and would be through the utilization of 800MHz equipment if Wyoming chooses that solution; otherwise, they will determine the direction and approaches to take with Wyoming once Wyoming's final technology selection is made. There is no consideration at the present time for data interoperability.

Idaho

Idaho presently has a mixed UHF and VHF analog conventional system. Base stations are

installed at 96 sites around the state. The current system is organized into six districts covering more than 82,000 square miles. It provides service to the Idaho State Police, the Idaho Transportation Department, the Bureau of Emergency Medical Services, Idaho Public Television, the Bonneville Power Authority, the United States Forest Service, and the FBI. Control of the base stations is via microwave and RF links.

Idaho has future plans for a Project 25 trunked digital system. No frequency band is decided. Idaho is considering VHF or UHF. Idaho would like to consolidate to one frequency band, but there may not be enough frequencies to do so. An RFP for a statewide plan was issued recently but was not awarded due to funding restrictions.

Currently, the system's microwave backbone is undergoing an eight-year modernization effort to upgrade it to a digital system at a cost of \$14.5 million. This upgrade is scheduled for completion in 2003. The upgrade will double the existing capacity for public safety use, permit the distribution of digital broadcast television for Idaho Public Television, provide additional capacity to foster better delivery of services to Idaho's citizenry, take a step closer to a seamless communication system, and provide for less agency duplication. A Multi-Agency Consolidated Dispatch Center, now open, houses essential dispatch operations for several state agencies. The new center is located at the Idaho State Police complex in Meridian.

Idaho is considering mobile data but most of the concentration is presently on the voice system. Idaho may also consider integrated voice and data if there are not enough frequencies for a separate mobile data system.

Idaho would like to have full interoperability with Wyoming but other than local agreements on sharing frequencies there is no intent on developing a plan until both states have identified a clear direction and strategy. Idaho sees achieving interoperability with Wyoming in the five to ten year time frame.

Nebraska

The State of Nebraska developed, bid and issued an "intent to award" for a statewide VHF P25 trunked radio system named NEVCOM - Nebraska Virtual Communication Network. Unfortunately, the funding for the implementation of this plan was not secured. Subsequently, Nebraska decided to review the above-mentioned process and determine an appropriate course of action. The revised plan and procurement is being managed by a new organization called SCAN (Statewide Communications Alliance of Nebraska) which is controlled and funded by local agencies. The SCAN system is envisioned to allow interoperability between all federal, state, county, municipal and private public safety responder utilizing a variety of equipment and technologies. The SCAN system is envisioned to be digital trunked 800 MHz system but the SCAN board has not made a final

determination on including the need for P25 compatibility. The implementation of the system may be three to five years out.

The state agencies throughout Nebraska currently operate on various analog conventional systems. The State Patrol has a VHF low band analog conventional system. There are 40 sites and the State Patrol has six dispatch locations. The dispatch centers and the sites operate on a regional basis. The Department of Roads has a VHF low band system and Games and Parks has a VHF high band system.

Within the State, there are extensive local interoperability arrangements that typically rely on patching, radio sharing, frequency sharing, and mutual aid channels. These arrangements are made locally and are not driven by any statewide plan or authority. Early discussions on interoperability have considered using voice over IP (VoIP) as the technology to achieve it with other states. This will need a substantial amount of further discussion based on the technology choices that both Nebraska and the surrounding states decide upon.

Montana

Montana has VHF analog conventional stations installed at sites around the state. The State Police, Bureau of Land Management, sheriff's departments of Montana, and fire departments of Montana use the system. The state does not maintain or control these systems

A Statewide Interoperability Executive Council (SIEC) is in the process of developing plans that will improve public safety communications. The SIEC will oversee the development of shared radio systems used by government agencies. The SIEC includes representatives from federal, state, local, tribal, and the private sector. Brian Wolf, State of Montana's CIO, chairs the council. The council approved a pilot project in the greater Helena area and Lewis & Clark County. The pilot system for Lewis & Clark County will be completed in 2004. The SIEC is seeking funding for the Southwest Interoperability project which is a Concept Demonstration Project (CDP). This CDP will provide radio equipment capable of digital communications and will provide improved infrastructure through a larger part of southwestern Montana. Law enforcement, fire, emergency medical services, transportation, and public works users will participate to show interoperability between all levels of government and public safety services.

The second project will focus on Montana's highline border with Canada. It will target law enforcement, specifically, with the intent of linking local, tribal, state, and federal officials together with radio equipment capable of secure, digital transmissions to help secure the northern border area. Site infrastructure and microwave backbone connecting key facilities will also be important parts of the project. Funding has been received and

construction will begin in the fall of 2004.

The SIEC has set the direction that all future systems should be Project 25 (Phase 1) compliant and operate in VHF high band. No decision has been made on whether the systems will be trunked or conventional or whether the configuration will be simulcast or multi-site.

Additional Interoperability Information

In addition to the above information, it should be noted that there is a group that recently formed to address interoperability issues in the region. The first meeting of the Northwestern/Mountain States Radio Alliance (NRSA) was held on February 13, 2003. NRSA consists of the following members: Alaska, Idaho, Montana, Nevada, Oregon, Utah, Washington, Wyoming, the U.S. Department of Treasury, Justice and Energy. A Memorandum of Understanding (MOU) was drafted but was not signed by the participating states. The NRSA decided to correspond by email or conference call occasionally to discuss interoperability issues. Dennis Hausman, Washington State Department of Information Services Management and Oversight of Strategic Technologies (MOST), chaired the meetings. Dennis Hausman can be reached at the following: Voice (360) 902-3463 or by email: DennisH@dis.wa.gov

Phase 1- Appendix I - Analysis of PSMC Efforts in Neighboring States

Info requested	Colorado	South Dakota	Utah	Idaho	Nebraska	Montana
POC	Larry Brooks	Jeff Pierce	Steve Proctor - Voice/UCAN, Floyd Ritter - UWIN, other	Jim Price	Mike Jeffres, Curt Beck (SCAN)	Jack Spillman
Title(s)	Digital Trunked Radio Project Manager	Director of Engineering	UCAN Director (SP); Senior Wireless Planner (FR)	Communications Manager	Radio Communications Manager (MJ); Project Manager, SCAN Board (CB)	Communications Technology Manager
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Web Page Address	http://www.colorado.gov/dpa/dot/comm/dtrs/	http://www.state.sd.us/news/iss/ues/25.pdf	http://publicsafety.utah.gov/2002report/UCAN.htm	http://www2.state.id.us/admin/itech/index.htm	http://www.doc.state.ne.us/NEVCOM/further_assistance.htm	http://www.discoveringmontana.com/itsd/policy/councils/SIEC/sec.asp
Statewide system? Voice/Data	63% of geography, 75% population. Voice only, data targeted in 2004, constrained by funding	Yes. P25 digital voice and separate data channels. Encryption not deployed	Intent is to be statewide. 12K users on UCAN system, 2K no on yet	Target system is P25, digital, trunked but won't be mandated. Plan to use existing freq's where possible	Not yet. One was bid and awarded but not funded.	No, Highway Patrol & DOT have systems
Included Agencies	All	All state/local, some feds.	All	Just State on current system, proposed system will be open to all state and local agencies	State	State
State Agencies	All	All	All	Forestry Conservation, EMS	Envisioned to include all.	Yes
County Agencies	As many as want to	All have radios	As many as want to	As many as want to	Envisioned to include all.	No, but share tower sites
City Agencies	As many as want to	All have radios	As many as want to	As many as want to	Envisioned to include all.	No, but share tower sites
Current Systems						
VHF High Band	some legacy systems	VHF High Band	Legacy, with UWIN	30% 150-160 MHz	Legacy, with some on VHF low band	Nearly all VHF highband
UHF				70% 450-460 MHz		City of Great Falls UHF
800 MHz	800 MHz SmartZone		800 MHz SmartZone		Planned	City of Billings 800 MHz
Planned Upgrade	On going	Completed VHF P25 trunking	Nearly complete	Yes but not designed or funded	Yes	Yes
Date Scheduled	Within 1 year - 2004	unclear, depends on funding	Yes	Not Scheduled at present	Pending funding	Waiting on money
Funding Secured?	Yes	Yes, partial	Yes	No - Looking	No.	No
How do agencies Interop now?	State system on 21 Talkgroups	New radio system	UCAN provides interop for participating entities; otherwise, local arrangements, and UWIN	Carry two radios	local arrangements	Local arrangements
How do municipalities Interop now?	State system on 21 Talkgroups	New radio system	those on system can interop, legacy systems are local arrangements	State allows municipalities to use their frequencies	local arrangements, very extensive	Local arrangements
Technologies Utilized?	P25 800 MHz Smartzone	SmartZone with P25 digital voice, analog trunking, the data is not interleaved. Mixed mode, S/W upgrade required for data encryption	800 MHz Smartzone 4.1 early version, 25 Khz radios	Analog	currently mostly VHF low band	VHF highband
Age of system	1999	New radio system	1998	Some pieces are 25-30 years old	very old	-1993, but Highway Patrol has new subscriber eq't
System Funding	General Revenue	General funds	General funds and grants for backbone	User fees--Agencies pay for their own	none yet	Seeking federal grants
User Fees	Not now	none	yes	Users pay for maintenance	unknown	Possibly, users would buy portables & mobile
Access Fees	Not now	none	part of user fees	unknown	unknown	Possibly
State Funded	Yes	100%	backbone	not determined yet	not determined yet	not determined yet
Importance of Interop w/ WY?	Yes There is connection via microwave currently.	very important	very important	Very important	Yes	Yes
Plans to interop w/ WY?	Would like to.	If we can	Yes	Not at present Some of our patrol have WY frequencies in their radios. Estimate 5-10 years to reach full interop	Dependent on technology and funding. VoIP is a possibility	Yes if VHF highband P25
Other Comments	Suggest WY consider P25 system include local agencies, not just State.	Thought about sharing our infrastructure?		Idaho is presently talking with Washington, Oregon and Nevada about interoperability. WY is welcome to join in. And hopefully MT.	http://www.scan-nebraska.org/index.asp	Suggest contact Northwest State Radio Alliance POC Dennis Hansman State of WA 360-902-3463
Primary Equipment Vendor	Motorola	Motorola (w/Motorola and EFJohnson subscriber units)	Motorola	Com, Motorola, Daniels. EF Johnson 800 trunked system at Boise State University Planning toward a Statewide P25 system pending funding. Mobiles/portables mix Kenwood to Relm BK	Motorola was awarded but protested, award retracted, SCAN took over project	Mixture of Motorola, M/A-COM and others