

# PUBLIC SAFETY TELECOMMUNICATION LEGISLATION GUIDELINES FOR OREGON POLICY MAKERS

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## **GUIDELINES FOR PUBLIC SAFETY TELECOMMUNICATIONS POLICY MAKERS**

Ensuring Oregon's future abilities to meet public safety telecommunication needs for day-to-day as well as emergency events means that legislators can expect that the many advocates for public safety, in all its forms, will continue to argue for improvements in public safety communications and interoperability. Any time requests for use of public funds comes into question, we need to be prudent throughout the decision-making process and in how we subsequently deploy those funds among competing ideas. The Oregon Wireless Interoperability Network (OWIN, HB 2101) project is but one of the Public Safety Telecommunication Communications issues to be addressed. Other requests quite likely will surface.

We offer the following guidelines to assist legislators and other policy makers render thoughtful and well-considered decisions. The Guidelines are posed as questions with responses that range from Highly Desirable to Less Desirable. The intent is to create a process of thoughtful examination and discussion of proposals that may surface, recognizing that often trade-offs between options will add some degree of complexity to the overall decision-making process. Questions on technical details are raised and, perhaps of equal if not greater importance, critical questions cutting to policy directions must be examined and answered.

### Guideline 1: Mobile Broadband Digital Multimedia

Does the proposed legislation and investment provide for a broad array of applications and types of connectivity (highly desirable, increases flexibility and return on investment) or is it limited to a single technology approach to serving public safety telecommunications needs (less desirable, potentially limits flexibility and reduces the return on investment)?

### Guideline 2: Multiple Applications on the Same Network

Does the proposed legislation and investment provide for multiple applications on the same network -- for example, voice, text messaging, instant messaging, e-mail, database searching, image transmission, video conferencing and other transmission of full motion video images (highly desirable, increases flexibility and return on investment) or is it limited to a single approach to serving public safety telecommunications needs (less desirable, potentially limits flexibility and reduces the return on investment)?

### Guideline 3: Flexible, Secure Communications

Does the proposed legislation and investment provide for the highest level of secured transmissions (highly desired, ensures secure encrypted communications that can connect to exactly the right preselected group) or does it allow for monitoring of communications by anyone (less desirable and can result in uninvited participation and perhaps loss of control in public safety related events)?

### Guideline 4: Universal Interoperability

Does the proposed legislation and investment provide for the highest level of standards-based interoperability (e.g., P-25) within federal, state and local agencies and for linking local agencies to state and federal resources (highly desired, ensures immediacy of interagency

response) or is it limited to a proprietary protocol and/or a narrowly defined set of contacts (less desirable and could contribute to failures to gain access to resources during a significant event)?

#### Guideline 5: Scalable Architecture

Does the proposed legislation and investment provide for a network design that is both scalable and independent of the type of terminal equipment connected to the network (highly desirable, maximizes longevity, results in a greater potential return on investment, and potentially eases the migration path from existing systems and networks, particularly for local government public safety organizations) or does it provide for limited growth options (less desirable, potentially creates interfacing issues, and likely will require additional large fund requests sooner than later)?

#### Guideline 6: Anchor Tenant in a Shared Network

Does the proposed legislation and investment provide for a multi-use shared network, one that appropriately leverages existing infrastructure where feasible-- public safety functions would have priority in that network -- for both public safety and other applications that will permit broadband Internet access for education, business, healthcare and residents (highly desirable, leverages the investment of public funds and further supports economic growth and quality of life for ALL Oregonians) or is it a high investment of funds for a limited purpose (less desirable and leads to overbuilding of networks and subsequently requires a great expenditure of funds)?

#### Guideline 7: Transforming the PSAP

Does the proposed legislation and investment provide for bi-directional broadband-enabled Public Safety Answering Points (PSAPs) that transform 911 centers to E911 centers with automatic digital location identification information, VoIP caller identification/location, reverse 911 services and to handle emergency "calls" made through e-mail, text messaging, digital video or other forms of communication (highly desirable, and maximizes efficiency and effectiveness of the PSAP) or does it provide for a limited, and "response-limiting," investment of public funds (less desirable and results in inefficient and ineffective responses to public safety events)?

#### Guideline 8: Flexible Frequency Options

Does the proposed legislation and investment provide for digital interoperability independent of frequency (highly desirable, increases flexibility and increases the return on investment) or is the investment tied to a particular frequency (less desirable, reduces flexibility for response and interoperability during an public safety event and likely results in an overall higher cost due to the need to add other devices to increase interoperability options)?

#### Guideline 9: Evidence Provided to Support a Request

Does the proposed legislation and investment rely on independent sources of information resourced from more than one entity (highly desired) or is the evidence sourced from a single entity (less desirable)? Were all of the pertinent stakeholders included in the process to define user needs and are those needs clearly documented?

## Guideline 10: Representative(s) Bringing the Request

Does the proposed legislation and investment request come from the appropriate authority -- wherein vendors and others may have provided information as part of a public RFI/RFP process and having been vetted in a public process -- to represent the request (highly desirable) or is it the result of a process wherein vendors directly participated in any part of the decision (i.e., voting on the recommendation) to bring the request forward (less desirable and raises questions of “undue influence.”)?

### **BACKGROUND FOR THE GUIDELINES**

#### **Growing Concern Over Public Safety Communications**

For some time now there has been a growing concern the effectiveness of communications capabilities in support of the information needs of first responders and other public safety workers.<sup>1</sup> Public safety agencies include the nation’s first responders (such as firefighters, police officers, and ambulance services) and a number of local, state, federal -- and sometimes regional -- authorities. However the concept of public safety communications is expanding as new technology makes it possible to include many whose role in preventing or responding to disaster lies outside the conventional definition of first responder. A more inclusive description of public safety responders might add to the list utility workers (often among the first on the scene, to shut down power sources), healthcare workers other than those in emergency medical services, operators in 911 call centers, school personnel, and bystanders at the scene of an accident or disaster.

#### **Communications Interoperability Defined**

Communications interoperability is defined as the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed and as authorized.<sup>2</sup> Facilitating interoperability has been a policy concern of public safety officials for a number of years. Since September 11, 2001 (World Trade Center) and August 29, 2005 (Katrina makes landfall) -- when communications failures added to the horror of the day -- achieving interoperability for public safety communications has become an even more important policy concern for legislators. The need for better governance and planning for interoperability is raised repeatedly.

Communications, often wireless radios, are vital to these agencies’ effectiveness and to the safety of their members and the public. Wireless technology requires radio frequency capacity in order to function, and existing wireless technology is designed to work within specified frequency ranges. Different operations, different applications, different rules and

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<sup>1</sup> “Public Safety Communications: Policy, Proposals, Legislation and Progress,” Linda K. Moore, Analyst in Telecommunications Policy, Resources, Science, and Industry Division, Congressional Research Service, The Library of Congress, <http://www.fas.org/sgp/crs/homesec/RL32594.pdf>, updated June 8, 2005, retrieved March 17, 2006 – Portions of the CRS report are paraphrased in this document.

<sup>2</sup> Methodology for Statewide Communications Interoperability Planning, SAFECOM, Department of Homeland Security, October, 2004, <http://www.safecomprogram.gov/NR/rdonlyres/C0327AC2-84ED-4E38-B9BE-04DDB09B45F9/0/VAExeSumFinal2.pdf>, retrieved March 17, 2006

standards, and different radio frequencies are among the problems first responders face in trying to communicate with each other.

### **Rethinking Public Safety Communications in the Broadband Digital Age<sup>3</sup>**

Technology can provide the capability to link all parties. Policy would determine the circumstances for, and type of, communication. We have an opportunity to integrate 21<sup>st</sup> century technology and thinking into our public policy decisions.<sup>4</sup>

The telecommunications infrastructure for public safety communications in Oregon is undergoing a massive transformation for a variety of reasons. The lessons from the 9/11 terrorist attacks on New York and Washington and from Hurricane Katrina are being disseminated widely. Federal, state and local funds are going into systems to provide improved interoperability. New technologies are providing new options. Most older public safety communications networks were designed to provide voice communications on radio networks. As we rebuild and replace older radio systems it will be useful to rethink the assumptions and applications of public safety communications in the light of new technical opportunities. The opportunities in the new broadband digital age are much different than they were in the age of narrowband analog voice communications. What follows are some thoughts about the opportunities we now face.

#### Mobile Broadband Digital Multimedia

The analog radio networks of traditional public safety networks were primarily useful for point to multipoint voice communication within a closed group of users. New mobile broadband digital multimedia networks permit a broad array of applications and types of connectivity that can solve a variety of public safety communications problems. If we free ourselves from the old assumption that public safety communications is only voice communications by radio, then a whole array of new options and choices emerges. We no longer need to think about emergency communications in the old paradigm and plan to fix the problems that have been exposed within that paradigm. Instead, we have the opportunity to rethink everything about public safety communications from scratch in a totally new context. We have the opportunity to reassess and redefine our needs. Of course we want to keep all the good features of what we have now, and fix the problems that we know about. But let's also think about all the new things we can do to improve public safety communications using mobile broadband digital media. Old assumptions die hard because they are ingrained in our thinking as an automatic subconscious process. It takes considerable effort to make explicit the old unstated assumptions and then challenge and rethink them in a new and different context. However, it will be worth the effort.

#### Multiple Applications on the Same Network

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<sup>3</sup> "Rethinking Public Safety Communications in the Broadband Digital Age" (draft for discussion), Ed Parker, Oregon Telecommunications Coordinating Council, February 12, 2006

<sup>4</sup> NRIC VII, Focus Group 1D, Communications Issues for Emergency Communications Beyond 911; Report #1 - Properties and network architectures that communications between PSAPs and emergency services personnel must meet in the near future ,” December 6, 2004, pp. 12; 26-27. PSAPs are Public Safety Answering Points, also known as 911 Call Centers. NRIC is a Federal Advisory Committee chartered by the FCC. See [http://nric.org/meetings/docs/meeting\\_20041206/FG1D%20Final%20Report.pdf](http://nric.org/meetings/docs/meeting_20041206/FG1D%20Final%20Report.pdf), retrieved March 17, 2006.

Voice communications will continue to be the dominant application and should have improved quality and features when transported over a broadband digital network. Other applications can include text messaging, instant messaging, e-mail, database searching, image transmission, video conferencing and other transmission of full motion video images. First responders should be able to access any information they need to respond to whatever situation they confront, whether that information is available from a co-worker, supervisor, remote public safety database, the Internet, or an expert on another side of the world (for example, a World Health Organization expert in Geneva when responding to a biological threat). Firefighters should be able to remotely access building plans for the structure they are defending. Responders to potential hazardous materials incidents should be able to remotely access hazardous materials inventory and properties databases. First responders should be able to send to supervisors and other appropriate officials, including those on call at their homes, still pictures and motion images as well as verbal descriptions of the scene they confront. They should be able to transmit to hospital emergency rooms images and vital signs of patients between transported (or to be transported) from the scene and get advice from emergency room physicians at an earlier stage.

### Flexible, Secure Communications

In some older public safety radio networks, the ability of members of the public to buy and use radio scanners that listened to public safety frequencies sometimes extended the group the radio frequency was intended for and prevented private communications among public safety personnel. New mobile broadband digital multimedia networks permit a broad array of applications with secure confidential communication between and among users. Secure encrypted communications can connect a preselected group instantly on a push-to-talk or live mike basis. Virtual private networks can restrict communication to whatever subset of network users is appropriate for the institutional arrangements of the public safety providers. When appropriate, multiple groups can be interconnected (for example, firefighters to police, ambulances and hospital networks).

### Universal Interoperability

Lack of interoperability has been a problem for federal, state and local agencies and for linking local agencies to state and federal resources. With the threat of bioterrorism and disease pandemics (whether SARS or bird flu or some other threat), interoperability between public safety and medical facilities and personnel is becoming critically important. No matter how many agencies cooperate in creating an interoperable system, there will always be some new incident or threat in which it would be useful to contact some authority or some expert not currently on that network. Local personnel may wish to contact some local expert not currently on the first responders net because he is vacationing in some other part of the world, or some expert in a different organization. Network connections should be possible from the public safety network to any point on the public-switched telephone network, any cellular telephone number, any Voice over Internet Protocol (VoIP) number and any Internet address. With a multimedia digital mobile broadband network, all of these connections should be possible for voice, data or video connections.

### Scalable Architecture

A digital network with sufficient capacity to connect everyone by voice will soon be totally congested if people start using it to transmit video on a frequent basis. We don't know how quickly new broadband applications will develop after voice applications are transferred to a new digital broadband network. But we can plan the network technical architecture to permit it to be scalable, that is, to permit significant expansion in the capacity of the network without making the terminal equipment obsolete. The Internet has become a global example of what is possible when a network is an interconnectable digital network and need not be restricted to communication with other devices using the same radio frequency. It should be able to interconnect with any other digital network, including those on other radio frequencies, copper wire, coaxial cable, fiber optics or any other medium used for digital communications.

### Anchor Tenant in a Shared Network

Public safety communications have typically operated on networks dedicated exclusively to public safety uses. That was essential, given the technical constraints of the radio networks being used for public safety communications. That assumption is no longer valid in the age of mobile digital broadband networks. The public safety network now operating in Oregon in the rural region surrounding the Umatilla Army Depot is an excellent example of a multi-use shared network. Public safety applications have priority on the network, but the broadband network capacity is sufficient that it also serves as a public Internet access network throughout the region. Other local government agencies, business, residents and tourists can all use the network.

Any mobile broadband digital network that meets all of the needs of public safety will also be ideal for a wide range of additional public and private sector applications. If the funds available for new interoperable public safety networks are used to purchase a priority access anchor tenant position in a multi-use broadband network, network costs can be lowered considerably. The public safety community can at the same time reduce their costs (or increase the size and quality of network they get for the amount of available funds) by sharing the network costs with other users. This assumes that public safety applications will have priority access to the network. The universal interoperability goals will be easier to meet in such a shared network.

Sharing a mobile broadband digital network with other public and private sector users will also help achieve a major Oregon economic development policy goal. Having a statewide mobile broadband network for both public safety and other applications will permit broadband Internet access for every school child, every business, every resident and every tourist passing through the state. The Oregon economy would benefit greatly from improved broadband connectivity and the public safety community would have a powerful political argument for additional funds because of the additional public benefit to the state. Mobile broadband digital networks could permit Oregon to provide affordable broadband access for all its citizens.

### Transforming the PSAP -- bi-directional broadband public safety communications centers

Public Safety Answering Points (PSAPs) have been centers for answering telephone calls and forwarding the information to the appropriate public safety responder. In the new age of mobile digital broadband, the PSAP could become a bi-directional broadband public safety communications center. Transforming 911 centers to E911 centers with automatic digital location identification information was a tiny step into the digital age. Now we have the

opportunity to bring PSAPs into the broadband Internet age. One first step will be to make the changes needed to provide E911 service directly for VoIP calls from Internet addresses without having to convert back to analog telephony interfaces. Another step will be to provide reverse 911 services for public notification of tsunami or other public safety warnings. Beyond that, broadband emergency communications centers should be equipped to handle emergency "calls" made through e-mail, text messaging, digital video or other forms of communication.

### Flexible Frequency Options

Once a commitment is made to multi-use mobile broadband digital networking, a wide variety of radio frequency options become available, not just frequencies reserved for exclusive use by the public safety community. Not everyone needs to be on the same frequency if the last-mile wireless part of the network is connected to wired (or fiber optic) backbone networks that interconnect with other wireless networks. In some rural communities unlicensed spectrum may be a low-cost alternative. Now that a firm date has been established for return of some broadcast frequencies for use in mobile applications, additional choices will become available. Lower cost end user equipment is more likely to be available for frequencies with broad commercial application. Wi-Fi and Wi-Max frequency options could also be used for public safety applications. The situation with respect to radio frequencies (and equipment to operate on them) is very much in flux at the moment, with Congress and the FCC intent on making additional frequencies available. There isn't any single answer that is right for all public safety applications in all geographic locations and the options will be changing over the next few years. Public safety communications planners will do well to stay flexible and cast a broad net through the many available choices before assuming that any particular frequency is "the answer." In any case, planning for digital interoperability independent of frequency is more important than the decision with respect to which frequency to use in any particular geographic location or any particular public safety organization.

### **Federal Activity**

The debate about public safety communications and the role of federal and state policy is long running. The framework for discussions -- which accommodate recent advances in technology -- most likely dates to a report in 1996 by the Public Safety Wireless Advisory Committee (PSWAC).<sup>5</sup>

Listed below are some key components of a desirable public safety communications policy for first responders described in the PSWAC study and in more recent reports, testimony, and other comments cited in this report. According to these sources, a national policy for public safety communications needs to address and correlate a myriad of complex goals, such as:

1. Coordinated assignment and use of spectrum at various frequencies.
2. Muscular and sustained efforts to complete the development and application of technical and operational standards.

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<sup>5</sup> The Public Safety Wireless Advisory Committee (PSWAC) was chartered in 1995, at the request of Congress, to study public safety spectrum and make recommendations for meeting spectrum needs through the year 2010. The following year, PSWAC submitted a report containing recommendations for the improvement of public safety communications over wireless networks. *Final Report of the Public Safety Wireless Advisory Committee*, September 11, 1996.

3. Public sector adaptation of new technologies already available in the private sector such as for high-speed, data rich, and video or image transmissions.
4. Long-term support of research and development for new technology.
5. Coherent goals that encourage private investment in technology development.
6. Nationwide network of communications operations centers (regional signal corps) that can serve as back-up facilities to each other and to state and interstate centers and networks.
7. Interoperability of communications among first responders and public safety agencies.
8. Managerial structure that can successfully coordinate not only disparate federal, state, and local agencies but also the different cultural and technical needs of independent first responder units.
9. Framework to match policy goals with implementation needs to assure the effectiveness of federal funding for programs and grants.

Conclusions from this assessment might to recommendations for the development of a nationwide network for public safety, as many have advocated. As has been noted by public safety communications experts, the federal government is but one operator of networks, in use or planned. There are also important networks operated or planned by states, and some private networks -- such as those owned by utilities -- that are accessible for public safety use. These networks could be linked through common interfaces to provide local, regional, or national coverage, as needed. The 9/11 Commission proposed a signal corps approach to public safety communications for high-risk urban areas. Such a capability would seem to include a system architecture to provide a backbone for wide area and local area networks and to support interoperability system-wide, as needed.

Assessments of public safety communications (PSC) that were made in the 1990s found that the nation's public safety agencies faced several important problems in their use of radio communications<sup>6</sup>:

- First, the radio frequencies allocated for Public Safety use have become highly congested in many, especially urban, areas....
- Second, the ability of officials from different Public Safety agencies to communicate with each other is limited.... Interoperability is hampered by the use of multiple frequency bands, incompatible radio equipment, and a lack of standardization in repeater spacing and transmission formats.
- Finally, Public Safety agencies have not been able to implement advanced features to aid in their mission. A wide variety of technologies -- both existing and under development -- hold substantial promise to reduce danger to Public Safety personnel and to achieve greater efficiencies in the performance of their duties. Broadband data systems, for example, offer greater access to databases and information that can save lives and contribute to keeping criminals "off the street." Video systems promise better surveillance capabilities, increased use of

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<sup>6</sup> Wireless Technologies and the SAFECOM SoR for Public Safety Communications, Leonard E. Miller, Wireless Communication Technologies Group, Advanced Network Technologies Division, Information Technology Laboratory, National Institute of Standards and Technology Gaithersburg, Maryland, <http://www.antd.nist.gov/wctg/manet/docs/WirelessAndSoR060206.pdf>, 2005, retrieved March 17, 2006

robotics in toxic and hazardous environments, and better monitoring and tracking of both personnel and equipment.

The national assessments of PSC have had significant impact on legislation, regulation, and funding. Since these assessments, significant reallocations of spectrum for PSC have been made through regulation. Also, through “refarming” (revising spectrum channel plans to implement narrower channels) and the standardization of trunking technologies, the efficiency of spectrum use by PSC is being addressed. Standards for PSC equipment have been written that improve the interoperability of radio systems from different vendors, and the need for interoperability in all its aspects is being dealt with systematically. Increased funding has enabled the upgrading of many local and regional PSC systems.

## SAFECOM

In an effort to coordinate the various federal initiatives, the SAFECOM program was established by the Office of Management and Budget (OMB) and approved by the President’s Management Council (PMC) as a high priority E-Gov initiative. More specifically, SAFECOM is a communications program within the Office for Interoperability and Compatibility (OIC) that provides research, development, testing and evaluation, guidance, tools, and templates for local, tribal, state, and federal public safety agencies working to improve public safety response through more effective and efficient interoperable wireless communications.<sup>7</sup>

The SAFECOM Statement of Requirements (SoR), released in April 2004, envisions PSC operations as taking place in a networking environment that is capable of operating as a “system of systems” in order to satisfy the requirements of public safety agencies for communication systems that provide increased functionality and efficiency, in addition to built-in interoperability. That is, wireless devices, local networks, regional networks, and wider area networks are envisioned as being able to “work together to pass information back and forth seamlessly.” The SoR lists the following system elements:

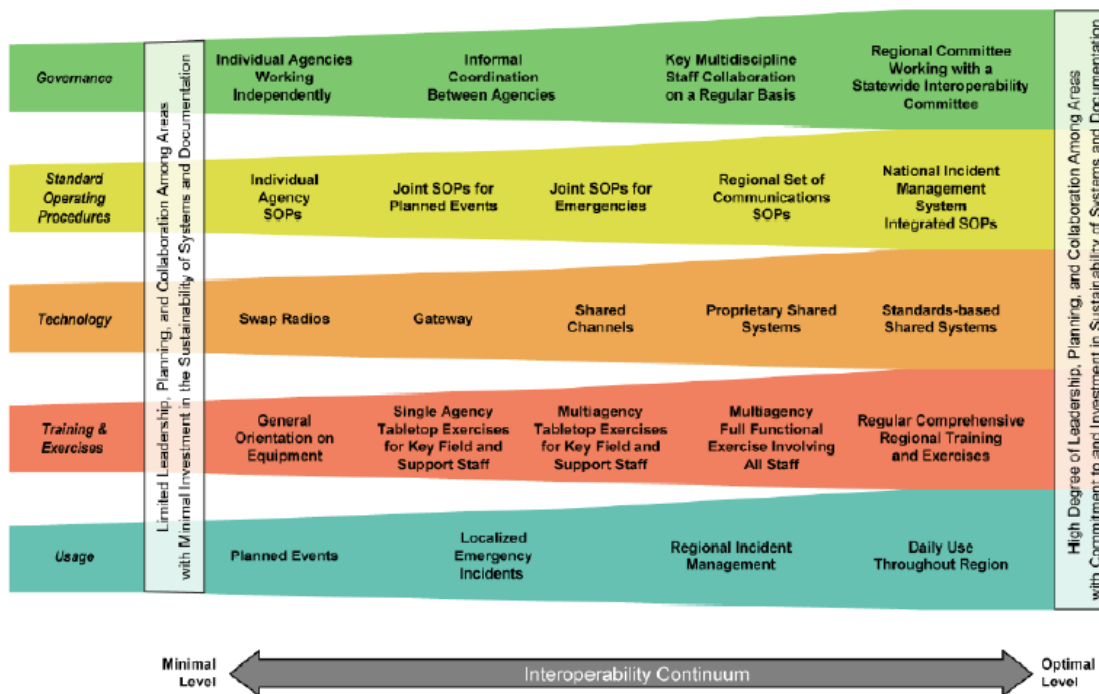
- PSC devices (PSCDs), which are handheld or wearable radios.
- Personal Area Networks (PANs), which permit wireless data sharing among PSCDs and sensors attached to an individual first responder, including data on the location, environment, and physical condition of that individual.
- Jurisdictional Area Networks (JANs), which are the permanent network infrastructure in particular cities or areas that are dedicated to PSC, capable of connecting to larger area networks.
- PSC user groups, which are sets of devices and/or personnel that are recognized by the system as authorized (either permanently or temporarily) to share communication and information, and that access portions of the existing network infrastructure as necessary, or forming an ad hoc network among themselves in the absence of an infrastructure.
- Incident Area Networks (IANs), which are temporary network infrastructures brought to the scene of an incident or otherwise configured for an incident.
- Extended Area Network (EAN), which consists of regional, state, and national network resources, particularly those dedicated to public safety communications.

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<sup>7</sup> SAFECOM, <http://www.safecomprogram.gov/SAFECOM/about/default.htm>, retrieved March 17, 2006  
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The SAFECOM program of the Department of Homeland Security (DHS) has developed the concept of an “interoperability continuum” to “help the public safety community and local, tribal, state, and federal policy makers address critical elements for success as they plan and implement interoperability solutions”. As illustrated by the following graphic, these elements include governance, standard operating procedures (SOPs), technology, training and exercises, and usage of interoperable communications. For example, in the element of governance, the minimal level of interoperability occurs when individual agencies work independently, while the optimal level occurs when individual agencies participate in regional and statewide interoperability committees.<sup>8</sup>

While technology is only one element of interoperability, it is very important. As the graphic suggests, a minimal type of interoperability between local agencies can be achieved by having them “swap” each other’s radios, in effect creating an overlap in their PSC implementations. A more sophisticated solution is to provide gateway equipment that will allow messages to be patched from one radio system to another. Better interoperability is of course achieved if the local agencies shared spectrum channels (simplifying the requirements for patching) and the best solution is for no patching to be required at because the agencies use compatible equipment -- either from the same vendor or based on a common standard.<sup>9</sup>



**Figure 1 -- Interoperability Continuum**

Project 25

Project 25 (P25) is the standard for interoperable digital two-way wireless communications products and systems. Developed under state, local and federal government

<sup>8</sup> ibid, Wireless Technologies and the SAFECOM SoR for Public Safety Communications

<sup>9</sup> ibid, Wireless Technologies and the SAFECOM SoR for Public Safety Communications

guidance and Telecommunications Industry Association (TIA -- Mobile and Personal Private Radio Standards Committee (TR-8)) governance, P25 is gaining worldwide acceptance for public safety, security, public service, and commercial applications. Equipment that demonstrates compliance with P25 is able to meet a set of minimum requirements to fit the needs of public safety. These include the ability to interoperate with other P25 equipment, for example so that users on different systems can talk via direct radio contact.<sup>10</sup> Three phases have been identified<sup>11</sup>:

- Phase I P25-compliant radios can communicate in analog mode with legacy radios, and in either digital or analog mode with other P25 radios.
- P25 Phase II implementations will involve time and frequency modulation schemes (e.g., TDMA and FDMA), with the goal of improved spectrum utilization. Significant attention is also paid to interoperability with legacy equipment, interfacing between repeaters and other sub-systems, roaming capacity and spectral efficiency/channel reuse. In addition, Phase II work involves console interfacing between repeaters and other subsystems, and man-machine interfaces for console operators that would facilitate centralized training, equipment transitions and personnel movement.
- P25 Phase III (AKA: Project MESA -- Mobility for Emergency and Safety Applications) planning activities are addressing the operation and functionality of a new aeronautical and terrestrial wireless digital wideband/broadband public safety radio standard that could be used to transmit and receive voice, video and high-speed data in a ubiquitous, wide-area, multiple-agency network.

Project MESA exists to facilitate dependable, advanced, efficient, effective and inter-operable equipment, specifications and applications that are involved with public safety-oriented broadband communication needs. Additionally, MESA will attempt to harmonize existing specifications and scenarios as part of its mandate. The end result will be a suite of standards and specifications harmonized for broadband terrestrial mobility operations, including connectivity to broadband satellite communications services, driven by common scenarios and spectrum allocations. Benefits to the Public Safety community and to the citizens they serve, will be realized in two distinct but highly related areas.

1. System end-users:

- In-building, portable voice and data coverage.
- Real-time support for wireless portable computer applications.
- Rapid messaging, including email, free-form text, and file transfers.
- Constantly updated personnel and equipment location data.
- Aerial video for major events, or disaster response coordination.
- Transmission and reception of high-resolution digital images.
- Satellite connectivity of disaster “hot-spots.”

2. System owner/operators:

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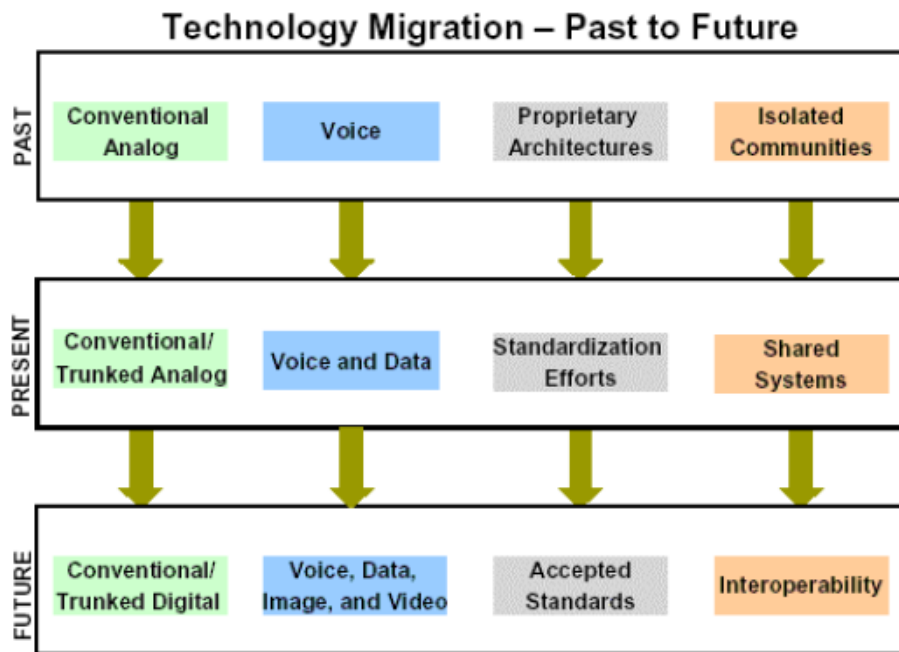
<sup>10</sup> What is Project 25, <http://www.project25.org/display.php?file=content/WhatIs/p25.htm>, retrieved March 17, 2006

<sup>11</sup> *ibid*, Wireless Technologies and the SAFECOM SoR for Public Safety Communications  
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- o Local, national, regional and international interoperability.
- o Frequency neutral technology.
- o Accommodation of multiple agency networks.
- o Network authentication and encryption.
- o Competition in system life cycle procurement.

The development of more effective and interoperable public safety communication systems nationwide therefore involves multiple aspects of technology evolution and migration, as suggested in the following bullets and graphic<sup>12</sup>:

- Radio technology continuing to migrate from conventional analog systems to conventional/analog trunked systems and in the future, to conventional/trunked digital systems.
- Communication content continuing to migrate from voice only to both voice and data and in the future, combined voice, data, images, and video.
- System architecture continuing to migrate from propriety architectures to open standards.
- Interoperation continuing to migrate from isolated communities to shared systems and, in the future, fully interoperable systems.



**Figure 2 -- Technology Migration -- Past to Future**

## Oregon Activity

### Statewide Interoperability Executive Council created

Oregon recognizes that public safety communication systems, and the ability to readily communicate among all public safety providers, play a critical role in protecting the lives and

<sup>12</sup> *ibid*, Wireless Technologies and the SAFECOM SoR for Public Safety Communications  
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 Revised: July 24, 2006

property of citizens and public safety professionals. The Executive Order NO. EO 02-17 that established the Statewide Interoperability Executive Council (SIEC) stated the following<sup>13</sup>:

“Given that the State's public safety communications infrastructure is rapidly aging and becoming outdated and the Federal Communications Commission is adopting policies and standards that affect communications systems, the State is going to have to make significant investments to upgrade its public safety communication system. These investments must be planned and leveraged in such a way so as to minimize the costs and maximize interoperability of these public safety communication systems.”

Item 2 further established the purpose of the SIEC:

“The purpose of the State Interoperability Executive Council is to provide policy level direction for matters related to planning, designing and implementing guidelines, best practices, and standard approaches to address Oregon's public safety communications interoperability issues. The Council shall also recommend funding strategies that support development of a statewide system, including seeking federal funding, or other funding, for statewide interoperability”

The establishment of the Oregon SIEC built on previous efforts in the state. SIEC's have been established in over 30 states to date in response to federal guidelines and local needs for a coordinated need for interoperability.

The SEIC released its Short-Term Recommendations for Interoperability in September of 2004.<sup>14</sup> SIEC's adoption of the standards listed in this plan was a recommendation to facilitate interoperability and there was no intent or action of the SIEC to mandate such use.

The SIEC released its Guide for Short-Term Interoperability in December, 2004.<sup>15</sup> The SIEC assembled this guide to assist non-technical, everyday public safety personnel in achieving simple, short-term interoperability solutions to enhance day-to-day operations that afford preparation for major multi-jurisdictional events. These short-term efforts are leading to longer term and much more comprehensive solutions to wireless interoperability for public safety agencies throughout the entire State of Oregon.

## HB 2304

A bill (HB 2304) addressing planning for use of broadband as a communications vehicle for public safety telecommunications was introduced in the Seventy-Second Legislative Assembly (2003), subsequently passed and was signed into law.<sup>16</sup>

Relating to broadband telecommunications policy; creating new provisions; and amending ORS 401.270.

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<sup>13</sup> Executive Order No. EO 02-17, [http://egov.oregon.gov/SIEC/docs/Exec\\_Order\\_02\\_17.pdf](http://egov.oregon.gov/SIEC/docs/Exec_Order_02_17.pdf), September 10, 2002

<sup>14</sup> Short-Term Recommendations for Interoperability, [http://www.oregon.gov/SIEC/docs/ShortTerm\\_Rec\\_09\\_07\\_2004.pdf](http://www.oregon.gov/SIEC/docs/ShortTerm_Rec_09_07_2004.pdf), September, 2004, retrieved March 17, 2006

<sup>15</sup> Guide for Short-Term Interoperability, [http://www.oregon.gov/SIEC/docs/SIEC\\_Publications/SIEC\\_Interoperability\\_Guide\\_12\\_04.pdf](http://www.oregon.gov/SIEC/docs/SIEC_Publications/SIEC_Interoperability_Guide_12_04.pdf), December 7, 2004, retrieved March 17, 2006

<sup>16</sup> Relating to broadband telecommunications policy; creating new provisions; and amending ORS 401.270, <http://www.leg.state.or.us/03reg/asures/hb2300.dir/hb2304.en.html>, retrieved May 16, 2006

Be It Enacted by the People of the State of Oregon:

SECTION 1. { + It is the policy of the State of Oregon to encourage and support the rapid deployment of broadband telecommunications services in areas of the state where such services do not exist, to support redundancy of critical telecommunications assets in order to ensure homeland security protections in the state and to ensure that a secure conduit is available for emergency communications and public safety networks in all Oregon communities. + }

SECTION 2. ORS 401.270 is amended to read:

401.270. The Director of the Office of Emergency Management shall be responsible for coordinating and facilitating emergency planning, preparedness, response and recovery activities with the state and local emergency services agencies and organizations, and shall, with the approval of the Superintendent of State Police or as directed by the Governor:

- (1) Make rules that are necessary and proper for the administration { + and implementation + } of ORS 401.015 to 401.105, 401.260 to 401.325 and 401.355 to 401.580 { + and section 1 of this 2003 Act + };
- (2) Coordinate the activities of all public and private organizations specifically related to providing emergency services within this state;
- (3) Maintain a cooperative liaison with emergency management agencies and organizations of local governments, other states and the federal government;
- (4) Have such additional authority, duties and responsibilities authorized by ORS 401.015 to 401.105, 401.260 to 401.325 and 401.355 to 401.580 or as may be directed by the Governor;
- (5) Administer grants relating to emergency program management and emergency services for the state;
- (6) Provide for and staff a State Emergency Operations Center to aid the Governor and the Office of Emergency Management in the performance of duties under ORS 401.015 to 401.105, 401.260 to 401.325 and 401.355 to 401.580 { + and section 1 of this 2003 Act + };
- (7) Serve as the Governor's authorized representative for coordination of certain response activities and managing the recovery process;
- (8) Establish training and professional standards for local emergency program management personnel;
- (9) Establish task forces and advisory groups to assist the office in achieving mandated responsibilities; and
- (10) Enforce compliance requirements of federal and state agencies for receiving funds and conducting designated emergency functions.

Passed by House May 12, 2003

Passed by Senate June 20, 2003

A number of reasons were presented to the legislators in support of the measure:

- Many areas do not have redundant public safety networks. A single point of failure (single vehicle accident) has caused 911 services to be unavailable for extended periods of time in certain parts of the state.
- Areas that do not have redundancy are further impacted through any loss of connectivity to access money through ATM's, for Pharmacies to access Medical Records, for citizens to purchase goods or services (if they don't have cash).
- Public safety agencies don't have the ability to call long distance if connectivity is severed and there is a single point of failure. This makes it difficult if not

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impossible to declare an emergency with the state or request assistance during a crisis.

- Public safety agencies are also limited in a call for mutual aid or for additional resources if there is a single point of failure.
- Hospitals and Public Health Departments are also limited in their ability to respond to any type of Bioterrorism incident if the connectivity and redundancy are not in place.
- Connectivity losses in some areas have caused the loss of 911 services for over a 24-hour period -- a level unacceptable to the areas residents and public safety providers.
- Future networks that will provide for Alert and Notification of Homeland Security information, in addition to HAM Radio Operators, Radio Stations, and Television Stations, must be in place throughout the state if our residents are to be protected.
- The Internet is a critical communication tool in the Public Safety Environment. The Internet provides the vehicle to send large amounts of data, to utilize Geographical Information Systems, to distribute digital and other photography, to distribute live video feeds and other imaging technologies that provide greater tools to our Public Safety agencies. Single point network failures now prevent Internet access during critical outages.
- The Internet further provides venues to conduct secure briefings, and to provide outreach to all areas of the state should transportation routes collapse, become blocked or somehow unavailable.
- The Governor, Emergency Management, State Police, State Public Health, and all county and municipal jurisdictions can participate in joint exercises and distance learning opportunities if broadband access is available.
- Oregon can participate and collaborate with other states if broadband is available and usable in the new realm of Homeland Security.
- Interoperability can be achieved via the Internet in some instances if all areas and all agencies can connect and communicate via broadband.
- 911 Centers statewide and potentially nationwide can be tied together if broadband is available to all areas.
- Our local police departments are crying out for better intelligence capabilities and broadband access can help tie our local, county, and state agencies to the Federal systems if broadband is available. The Washington DC sniper was pulled over eight times and there was not intelligence on him so he wasn't detained. The Federal Government is working and President Bush spoke to the need to establish a national Intelligence Center during his State of the Union address. If this Center is to benefit all of America, we need to be connected so our police agencies can get live information in time for it to matter.
- We are working to deploy MCT's (Mobile Computer Terminals) or MDT's (Mobile Data Terminals) in our Public Safety vehicles (police cars, fire trucks and ambulances), but unless they have access to the public safety network, trying to enhance the communications structure is pointless. Additionally, having this equipment in the vehicle provides a channel for secure communications that cannot be picked up by a modern scanner device tuned to listen to police or fire frequencies. It also frees up valuable radio airtime for the most critical matters. Think of this in terms of the World Trade Center event and the huge amount of radio traffic that must have occurred.

- It is critical that unserved and underserved communities have the same opportunity for “Safety” as the areas that have broadband. Homeland Security is not specific to Urban or Rural...to quote the Speaker of the House on CNN last week... “the next major terrorism event in this country will not likely be a repeat of the World Trade Center, it will be an Al Qaeda cell in Omaha, Nebraska or some other small town.” We need to be prepared. Broadband will provide stronger communication capabilities and the ability to communicate before an event as well enhancing our ability to plan.

No apparent activity ensued from the passage of this measure.

### State Wireless Infrastructure Investment Group (SWIIG)

State Wireless Infrastructure Investment Group (SWIIG) is composed of the following entities:

- SIEC Coordinators
- State Departments
  - Administrative Services
  - Corrections
  - Emergency Management
  - Forestry
  - Military
  - State Police
  - Transportation

In a briefing<sup>17</sup> in April of 2005 SWIIG presented information on the following:

- The extent of the centralization of Oregon’s radio and microwave infrastructure
- The state’s role in a statewide interoperable radio solution
- The state’s present emergency communications in its major user departments
- A look at a staffing model for Homeland Security’s emergency communications section

In that briefing a system of systems was proposed:

Suits all levels of government in Oregon

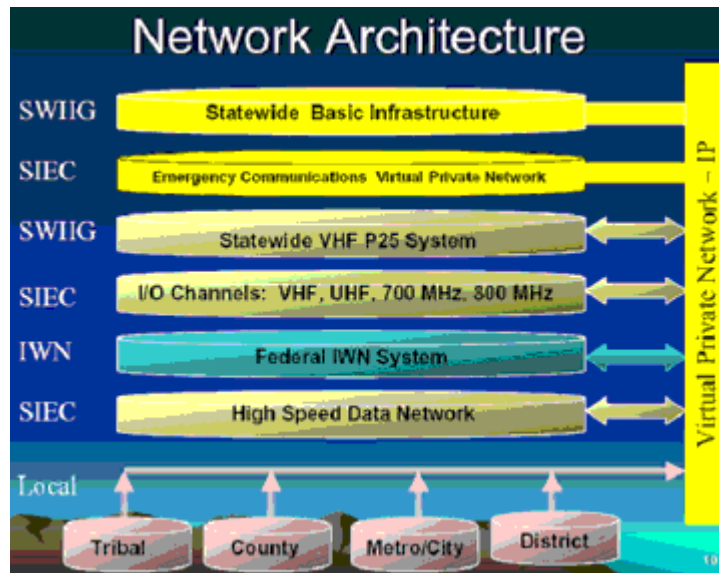
- Allows ownership and operation of systems in the same way as is presently done
- Does not mandate or force a solution on anyone
- Achieves high levels of interoperability through use of a statewide network
- Allows every jurisdiction to choose the level of technology that they think is best for them
- Allows for continued expansion and growth

Achieves high levels of reliability with mission critical importance

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<sup>17</sup> “Briefing for Oregon’s SIEC on Communications Infrastructure Consolidation,” State Wireless Infrastructure Investment Group (SWIIG), April, 2005, [http://egov.oregon.gov/SIEC/docs/SIEC\\_Meetings/SIEC\\_SWIIG\\_Briefing\\_APR\\_12\\_2005.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_Meetings/SIEC_SWIIG_Briefing_APR_12_2005.pdf), retrieved April 16, 2006. *Editor’s note: highly recommended reading!*

- Is the most cost effective model: agencies and jurisdictions have different requirements and needs and therefore different systems



**Figure 3 -- Network Architecture**

The briefing presented a discussion of capabilities and current facilities, a number of which truly need replacement and some of which might be upgraded.

The briefing positioned guidelines for building the infrastructure, including:

- Digital, high capacity microwave
- Loop architecture for ultra reliability
- Towers sized for great future growth
- Adequate and reliable power source
- Buildings sized to handle federal, state, and local needs
- Buildings incorporate maximum security measures:
  - Concrete and steel building construction
  - Microwave and Supervisory Control And Data (SCADA) Acquisition (alarm) systems
  - Fenced -- anti intrusion measures
  - Door and proximity alarms
  - Switchable video surveillance
  - Video recording
  - Remote two-way audio capabilities

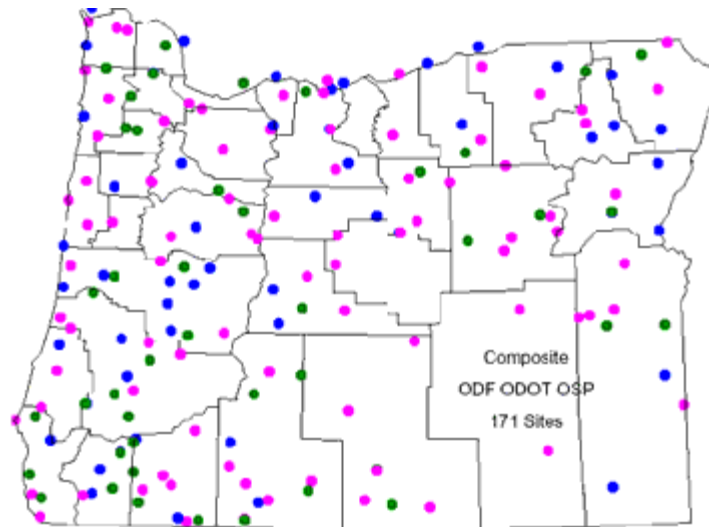
State System Design Goals:

- Link, in service, reliability of 99.9995%
- Link, 158 seconds (or less) per year down time
- All facilities meet R56 grounding and power requirements
- All critical circuits are automatically alternate routed
- Radio coverage: statewide, mobile radio based 95% area -- 95% of the time. Portable radio based on interstates and some highways

- Minimum of 70% of technical time is devoted to preventive maintenance

The current location of ODF, ODOT and OSP sites was reviewed (see following figure).

- Oregon Department of Forestry -- 55 sites
- Oregon Department of Transportation -- 96 sites
- Oregon State Police -- 103 sites



**Figure 4 -- ODF, ODOT and OSP Microwave Sites Today**

The consolidation proposal should reduce the number of sites:

- Engineered coverage should eliminate overlaps
- Trunking puts site control in the system instead of in the vehicle
- As local government uses improved facilities, the total number of Oregon public facilities should go down

### House Bill 2101

The Oregon Legislature's passage in 2005 of House Bill 2101<sup>18</sup>, requires both an SIEC Interoperable Communications Plan within six years and an Oregon Emergency Management State Infrastructure Replacement Plan by January 2007.

The Public Safety Communications Interoperability: Inventory and Analysis Report was released in February of 2006. Two main deliverables were produced for the SIEC by this project: (1) A gap analysis describing and quantifying the current stat of interoperability among first responder radio systems and (2) an inventory of public safety radio equipment and infrastructure.<sup>19</sup>

<sup>18</sup> HB 2101, <http://www.leg.state.or.us/05reg/measpdf/hb2000.dir/hb2001.a.pdf>, retrieved March 17, 2006

<sup>19</sup> Public Safety Communications Interoperability: Inventory and Analysis Report, [http://www.oregon.gov/SIEC/docs/SIEC\\_Publications/Inventory\\_and\\_Analysis\\_for\\_Oregon.pdf](http://www.oregon.gov/SIEC/docs/SIEC_Publications/Inventory_and_Analysis_for_Oregon.pdf), Sparling, et al, February 1, 2006, retrieved March 17, 2006

“The research contained in this report shows that interoperability problems are not going to be easy to solve and that local governments on their own cannot resolve them completely. Technological barriers, spectrum assignments, physics, geography, and economics are working against system owners, PSAP managers, and end-users to communicate with whom they must, when they must. However, technology advancements in radio and wireless technologies are developing quickly and hold promise for closing the gap between first responder needs and available technology, even when spectrum assignments are in multiple bands.

*It is not possible to say definitively whether Oregon’s levels of interoperability are worse or better than levels of interoperability in other states since data from other states are not standardized. Studies done by the Department of Justice and National Task Force on Interoperability (NTFI) show that the main impediments to interoperability in Oregon are shared by other states across the nation.”*

The report further states:

Oregon’s approach, focused on collaborative planning, is in many ways distinct from other states that have chosen to deploy a single statewide system. If Oregon’s governance structure is credible and accepted, it will pave the way for a more efficient investment in infrastructure across all areas of Oregon. Coupled with a concerted effort to develop a coordinated statewide digital backbone network (the building block to achieve statewide interoperability), increased investments in state and local planning can be leveraged to significant interoperability gains in the future.

Funding remains a critical issue: federal investments will allow progress in the near term, but a stable financial base to develop, maintain, and operate interoperable radio systems will ultimately be necessary.

### Public Safety Communications System Design & Engineering Services (RFP)<sup>20</sup>

The State of Oregon (State), acting by and through its Department of Administrative Services (DAS), State Procurement Office, (SPO), on behalf of the State’s Office of Emergency Management, (OEM), issues Request for Proposals #102-7013-5 (“RFP”) seeking proposals (“Proposal” or “Proposals”) to establish a Contract for Public Safety Wireless Communications System Design and Engineering Services. The purpose of this solicitation is to receive solutions-based Proposals from qualified entities (“Proposer” or “Proposers”). It is anticipated that the project will require two (2) phases.

In general, Phase I will involve conceptual design and engineering services for a statewide digital microwave system, a trunked statewide digital radio system, and the facilities/towers required to support and house that infrastructure across Oregon. Phase I must be completed by November 1, 2006. Since each of the three (3) subject areas depends upon the others, the Proposer is to consider the design of each major area in concert with the needs of the other two.

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<sup>20</sup> “Design and Engineering Consultant, State Public Safety Wireless Communications System,” September 9, 2005, [http://egov.oregon.gov/SIEC/docs/STATE\\_RFP/RFP\\_102\\_7013\\_5\\_Oregon\\_PSWCS\\_Design\\_Engineering.doc](http://egov.oregon.gov/SIEC/docs/STATE_RFP/RFP_102_7013_5_Oregon_PSWCS_Design_Engineering.doc), retrieved March 17, 2006

Phase II is an optional phase for consulting and quality assurance oversight services related to the new system detailed design that will be activated, if at all, at the State's discretion. At some reasonable point before or after completion of Phase I, DAS, in conjunction with OEM, will determine whether or not to engage in Phase II consulting and quality assurance oversight services with the successful Proposer. However, the State may ultimately determine to go out with an RFP for the Phase II consulting and quality assurance oversight services. The Phase II detailed design services, the construction of the statewide digital microwave system and the trunked digital radio system (including the facilities/towers to support and house the system), and the quality assurance on the construction of the statewide digital microwave and radio system are not within the scope of this RFP.

The goals of this public safety wireless communications system -- design and engineering consultant services -- RFP are to:

1. Understand with a high degree of certainty the design and construction requirements, costs, and implementation schedule for the consolidated statewide public safety wireless communications system;
2. Acquire the information needed to develop and deliver a State public safety wireless communications interoperability plan to the Oregon Legislature by January 2007;
3. Acquire technical consulting and quality assurance services related to future State procurements for the construction and build out of:
  - (a) a digital microwave system connecting major Oregon communications facilities into a coordinated system of dispatch and radio transmitter and receiver locations;
  - (b) a consolidated, State Agency public safety wireless communications system, meeting FCC mandates, State agency operational requirements, and State interoperability requirements, by 2013.
  - (c) a series of reliable communications facilities to meet the operational capacity and coverage needs of State Agencies and the collocation needs of other government public safety and emergency responder agencies.

#### Current Oregon Public Safety Telecommunications Environment (ODOT, OSP and ODF)

ODOT presently has approximately eighty (80) hops of analog microwave, and OSP has approximately thirty (30) hops of digital microwave. OSP and ODOT have developed a concept of a consolidated microwave system that is needed to support a statewide digital radio system that could result in as many as 150 individual microwave sites or nodes. This information will be supplied to the successful Proposer of the RFP.

The State has determined, and the legislature has confirmed, that Oregon should replace its disparate radio systems with a statewide, trunked, digital radio system and a statewide microwave system for the use by all State Agencies. OSP currently uses 103 sites, ODOT, uses approximately 90, and ODF uses about 60. Many of these sites are used by all three (3) agencies. In total, these agencies have approximately 170 different radio sites. Other than for the OSP system, most of those sites are not currently connected to dispatch centers by microwave. The state expects that a trunked radio system will require more sites to have microwave connectivity to centralized control equipment.

The State is also a primary supporter of the Oregon State Interoperability Executive Council (SIEC). The SIEC is charged with providing policy level direction for matters related to planning, designing, and implementing guidelines, best practices, and standard approaches to address Oregon's public safety communications interoperability issues. Recent SIEC policy action and legislative direction, from the 2005 State Legislative Assembly via House Bill 2101, has expanded the charter of the SIEC to include the identification and recommendation of a solution for public safety wireless communications interoperability in concert with the Office of Emergency Management. The State's microwave system and its series of communications buildings and towers is thought to be the infrastructure that is needed to support a secure, dedicated Internet Protocol network for statewide support of public safety's interoperability needs.

For those with a broadband connection available, the October 19, 2005 Presentation Video is worth watching (<http://tinyurl.com/z45w7>, requires RealPlayer).

### Contract Awarded/Scope of Project Presented

Federal Engineering, the company awarded the contract, provided a presentation<sup>21</sup> at a "meet the contractor" at a public meeting, that covered a number of project-related topics.

In that presentation the review of the scope and goals included the following statement:

"Understand with a high degree of certainty – the design and construction requirements -- costs, and implementation schedule for a consolidated statewide public safety wireless communications system."

The project scope is to provide the information needed to develop and deliver a State public safety wireless communications interoperability plan to the Oregon Legislature by January 2007. In particular to provide the support for future State procurements, including:

- A digital microwave system connecting major Oregon communications facilities
- A consolidated, State Agency public safety wireless communications system
- Reliable communications facilities to meet the needs of State Agencies and other government public safety and emergency responder agencies
- Frequency coordination services for the proposed microwave and LMR systems

The presentation further described process to be followed and set forth a number of target dates for a variety of project milestones.

At a February 14, 2006 SIEC meeting Neil Horden of Federal Engineering introduced Dennis Hausman as additional staff to the engineering and design contract that was awarded to his firm. He advised that Federal Engineering will be providing a full status report at each SIEC meeting.<sup>22</sup>

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<sup>21</sup> "Public Safety Wireless Communications System Design/Engineering Services Program Orientation," February 10, 2006, [http://egov.oregon.gov/SIEC/docs/OWIN/FE\\_Orientation\\_SIEC\\_Presentation\\_2\\_10\\_2006.pdf](http://egov.oregon.gov/SIEC/docs/OWIN/FE_Orientation_SIEC_Presentation_2_10_2006.pdf), retrieved April 16, 2006

<sup>22</sup> Oregon State Interoperability Executive Council Minutes of Meeting, February 14, 2006, [http://egov.oregon.gov/SIEC/docs/SIEC\\_Meetings/siec-notes-2-14.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_Meetings/siec-notes-2-14.pdf), retrieved April 14, 2006

## Assistance Memorandum on Interoperability Planning (to counties)

This memo<sup>23</sup> provides information and suggests elements for developing a local interoperability plan. It is provided by the SIEC as a resource. It is the hope of the SIEC that this information will be a useful starting point for interoperability planning.

“For the purposes of coordinating communication agencies, the SIEC recommends including a broad range of public and private entities that provide public safety services, including: emergency management, police, fire, emergency medical service, hospitals, transportation, public works, utilities, forestry, municipal and commercial airports, U.S. Coast Guard, and other state and federal agencies that operate radio systems within a service area.”

## OWIN finance Strategy

On April 11, 2006 the SIEC adopted a report on OWIN Finance proposal by the SIEC Finance Committee.<sup>24</sup>

“The SIEC Finance Committee recommends to the SIEC adoption of the attached financial strategy on construction and operations for the development of the Oregon Wireless Interoperability Network (OWIN).

There are two basic strategies: 1) Construction, financed by the State of Oregon and federal resources equally, and; 2) Operations, financed principally by subscribers but inclusive of State of Oregon finances in the area of public safety (radio owning agencies).

### **Construction**

Consistent with the Governor’s letter sent to the Oregon Congressional Delegation, the SIEC Finance Committee is recommending that the federal government share equally in the cost of construction. However, the committee is recommending that the State of Oregon position itself to finance, through certificates of participation (COP), all financing necessary for construction in the 2007- 2009 budget period so we can move forward at the pace necessary to meet Federal Communications Commission (FCC) requirements.

Securing federal financing is essential to the success of this strategy. Federal financing through formula funds, earmarks, and special allocations can offset sales of COPs by the State of Oregon and this objective will require a multi-year effort; with a recent briefing of Congressional delegation staff, this effort is just beginning.

It is the committee’s expectation that the work of the governor, legislature, and the SIEC, in collaboration with the congressional delegation, will result in tangible federal financing opportunities that will significantly contribute to the construction of OWIN. At the same time, the committee does not underestimate this task; for perspective, if the federal investment over the next eight years were made in cash as opposed to debt

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<sup>23</sup> “Assistance Memorandum on Interoperability Planning,” February 11, 2006, [http://egov.oregon.gov/SIEC/docs/SIEC\\_Publications/County\\_IO\\_Planning.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_Publications/County_IO_Planning.pdf), retrieved April 16, 2006

<sup>24</sup> “SIEC Finance Committee Report and Recommendations,” April 11, 2006 [http://egov.oregon.gov/SIEC/docs/SIEC\\_POLICY\\_ACTIONS/finance\\_strategy.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_POLICY_ACTIONS/finance_strategy.pdf), retrieved April 16, 2006

participation the federal government's obligation would be approximately \$32 million per year (assuming the federal share of the system construction expense is \$250 million).

Current OWIN construction costs are estimated at about \$500 million. This estimate assumes wholesale replacement of nearly all of the state agency owned communication sites currently in operation across the state. The OWIN design and engineering study now underway will produce a detailed cost estimates for the system in the fall of 2006, as the contractor's work on the conceptual design, business case and implementation plan is finalized. The strategy anticipates this variability of cost and can be adjusted on the state and federal level to reflect refined cost estimates.

As the most readily accessible funding source for paying off debt, the Finance Committee is recommending a public safety communication surcharge on wired and wireless phones as one option. There is a direct connection between the benefit of the OWIN system to the Oregon public both in terms of safety and to help meet the public's need for greater wireless communications access. Phones are a "common denominator" as they are widely owned by the public and, to a significant degree, generate the need for public safety agency migration to narrow band communications. Though FCC policy is driving public safety investments in narrow banding communications technology and digital infrastructure, and increasing costs for public safety agencies, the overall FCC policy is benefiting the public by making more spectrums available for wireless devices and high-definition signal transmission.

The committee recognizes the similarity of this recommendation to the current 911 system funding stream. To be clear, it is not the intention of the Finance Committee to detract from or jeopardize the current 911 system funding stream. The committee recognizes and supports sustained funding for the 911 system as it is critical for effective public safety response to criminal and life threatening emergencies. This recommendation concerns critical funding for a distinct and separate public purpose.

The public safety communication surcharge is one construction finance concept. However, the Finance Committee is mindful that other options should be reviewed as ideas are presented and seeks suggestions that augment or propose alternative methods of generating the necessary revenue to pay for OWIN construction. For instance, another construction finance concept that will be reviewed and developed by the SIEC Finance Committee is the feasibility of a utility bill surcharge; the use of lottery funds will also be explored. The committee stands ready to pursue and develop the feasibility of proposed concepts.

## **Operations**

In concept, the Finance Committee believes that users of OWIN should equitably pay for operations of the system, and that the economies of scale and efficiencies OWIN will provide are high-value reasons for public agencies across Oregon to choose to be a part of a consolidated communications infrastructure.

Many of the long term costs of operations, maintenance, and replacement of the OWIN system are unknown. However, the process of estimating the operational cost for the next three biennial budgets is underway. By June of 2006 it is possible to have a good estimation of the operational budget required for the 2007-09 budget and to build a projected, full operations budget for 2009-2013 based on an agency size of 50 technicians and managers (plus supplies, equipment, rent, etc.). This is a critical estimate that will allow us to determine a projected subscription fee level. The other critical area for

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development of the subscription fee is to understand how many subscribers will be a part of the system. The current method the Finance Committee is recommending is the same as used by the Oregon Department of Forestry (ODOF). The ODOF finance formula includes operations, maintenance and replacement.

Since the SIEC's goal is to provide interoperability, the committee's recommendation is to include an assumption that subscription fees/charges for system use/costs will be born by all Oregon public safety agencies (keeping in mind that non-state agency use of and payment for the system will occur on a voluntary basis). This high-level of connection to the system will be a function of the actual rates charge – if the subscription fee is excessive this assumption will not hold.

*It is the goal of the Finance Committee to insure that the subscriber rate is a competitive value for local subscribers. This is a critical consideration for the SIEC, as our financial policy must incent broad adoption of the system to achieve our interoperability objectives for the state as a whole.*

After a preliminary rate is estimated it is our recommendation that it be reviewed by all SIEC public safety partners to help determine the acceptability of the rate. If the preliminary rate is found to be too high, the Finance Committee will consider the elimination of system “replacement” from the method of finance. However, the Finance Committee believes the financing of replacement infrastructure is essential to insure long term effectiveness. As we have learned in the past, not addressing replacement simply rolls-up a higher bill in the future as a result of “deferred maintenance”.

Should “replacement” infrastructure not be included in the operational method of finance, the committee may recommend that the SIEC consider making it a part of the Public Safety Communications Surcharge (phone service). One way to do this would be to set the surcharge as a permanent surcharge. The complexities of matching the rate of surcharge to the various debt levels and replacement needs are beyond the scope of our current recommendation, but it is clearly possible to create estimates that would account for these various costs over the next 20 years.”

### SIEC presentation to the ORTCC

At a May 25, 2006 session of the ORTCC Jeff Johnson, Chair of the Oregon State Interoperability Executive Council (SIEC) <http://www.oregon.gov/SIEC/>, was joined by Sean McSpaden and Don Pfohl of the SIEC technical committee and by Marla Rae and Steve Marks who provide the SIEC with staff support. The minutes<sup>25</sup> of the session reflect the following comments:

“SIEC was created by executive order in 2002 to address the needs for public safety communications in Oregon. Jeff noted that there are currently four separate state communications systems operated by the Oregon Departments of Corrections, Department of Forestry, State Police, and the Department of Transportation. There are also independently operated county and city communications systems.

Currently fire departments in the state cannot communicate with other fire departments outside there area, yet they need to be able to rely on other departments for mutual aid.

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<sup>25</sup> SIEC Presentation, Minutes of the Oregon Telecommunications Coordinating Council, <http://www.ortcc.org/PDF/meetings/0506/052506Minutes.pdf>, May 25, 2006

The same situation is currently true for police departments. Today, there is no comprehensive plan or ability to provide for interoperable public safety communications in Oregon.

House Bill 2101 was passed in the 2005 legislative session and codified many parts of the original executive order. The SIEC has a broad based membership of local governments, state agencies, associations, legislators, and interested parties. SIEC has formed three key committees - Technical, public-private partnership, and strategic planning, to do its work.

Jeff noted that another factor impacting the project is the Federal Communication Commission's 2013 narrowbanding requirements to transition from "fat bandwidth" consuming analog systems to nimble bandwidth conserving digital systems. Jeff is concerned that if the state does not move to develop a comprehensive interoperable plan, individual system operators will move forward independently to meet their needs and obligations without regard for statewide interoperability. The time to act is now.

Jeff indicated that the SIEC is wide open to different technologies and resources available in the existing infrastructure to meet its objectives. SIEC plans to meet with Oregon's telephone companies and wireless service providers as to the roles they may be able to play. This has been envisioned as an open technology shared "system of systems."

SIEC is working on Phase I of a statewide infrastructure project for the planning, design, engineering and construction of an interoperable statewide public safety communications network, called Oregon Wireless Interoperability Network (OWIN). An engineering firm has been contracted to work on Phase I of the Project to develop a conceptual design and engineering for a statewide digital wireless communications system. The specifics of design, frequencies, and technologies are not yet known.

Jeff noted that projected costs are very high, approximately \$500 million. It is anticipated that the federal government will provide 50% of the funding. The state will also have to provide funding support. SIEC's goal has been to overestimate costs and positively surprise people with a lower actual cost. SIEC also intends to provide the legislature with a number of solution options. SIEC anticipates that end users of the system will pay toward the ongoing operating costs and will choose to use the system because it meets their needs. He does not believe that it is viable to try to mandate use of the system.

We are faced with two scenarios; one in which current analog and legacy systems are upgraded independently, and another in which we pursue a common logical system that provides for interoperability, that considers the needs of local providers/users, and that provides an integrated plan for the sharing of resources.

Marla Rae added that Rob Myers, a member of ORTCC, has been involved with SIEC and the public-private partnership committee.

Link Shadley commented that a stated objective of SIEC is to facilitate the growth of wireless infrastructure deployments. Link asked that SIEC consider adding a community component as well. Link noted that there are private sector providers deploying infrastructure and public sector users such as state government deploying infrastructure, but there are also community-sponsored systems emerging using WiFi, WiMAX, and other technology infrastructures. Link asked that there be some provision to include these networks in the plan. Ed Parker added that some communities are looking at developing multi-user wireless networks with public safety as the anchor tenant.

Cathy Britain asked if healthcare is included in the public safety community of users? Marla Rae responded that public health and emergency services are included in the planning effort as well as public utilities, schools, public works, cities, and counties.

Don Pfohl is the Oregon Department of State Police Communications Manager and OWIN Project Manager. He provided a technical overview of the project.

Current Oregon State Radio Systems:

- Forestry – Fifty-year-old technology
- Department of Corrections is mainly at institutions
- Department of Transportation
  - o Unreliable
  - o Obsolete
  - o Do not meet coverage, capacity or data needs
- Oregon State Police
  - o Unreliable
  - o Obsolete
  - o Do not meet coverage, capacity or data needs
- Are usable only by a single user
- Do not meet FCC narrowbanding requirements

What do we do now?

- Three departments have large, independent radio systems and radio maintenance organizations
- ODOT and OSP use microwave systems to connect radios to two dispatch centers, one in Salem and one in Central Point.
- No state agency has wireless data today
- Each agency only has one talk path per coverage area
- All systems use 50 year old (FM voice) technology
- All have coverage deficiencies – no department is without problems
- All have capacity issues due to single talk paths
- We currently have little State agency interoperability
- We have less overall public safety interoperability

What do we have to do?

- FCC Rules (CFR47) – By 1/13/2013, we must replace four disparate, voice radio systems and all associated equipment with more efficient, narrowband digital technology and cease operations on existing radio systems
- HB2101 – Consolidate state systems into one, state system concurrent with 2013
- HB2101 – Facilitate statewide public safety radio interoperability

John Irwin recommended that people read HB2101 to understand the scope of what it requires.

What do we need to do?

- Replace buildings and towers (present condition, capacity, reliability, efficiency, economical operation are poor). Most communication failures are due to hardware failures. Most of the equipment is thirty plus years old.
- Replace the microwave system (present condition, analog will not handle modern types of traffic, increase capacity, increase reliability)
- Replace the voice radios (narrowband, increase mobility, communication security, increase capacity, state agency interoperability)
- Develop one state system instead of four separate systems (leverage expenditures to get more bang for the buck)

#### Additional goals

- Get better statewide coverage with the new systems
- Get more capacity for all departments
- Facilitate one system that supports both wireless voice and data
- Get full interoperability between all state departments
- Get interoperability with local and federal users

#### Other opportunities

- Propose Oregon developed models that can be applied nationally
- Facilitate the growth of commercial wireless infrastructure to better serve the entire state with modern services
- Look at integrating commercial network elements where they exist and where doing so meets reliability demands

John Irwin asked if the Federal government was involved in the project given the extensive Federal land holdings in Oregon. Don responded that it is not, though many of the transmission sites are in fact on BLM or USDA Forest Service land. Jeff Johnson added that there are conflicting rules and positions between different Federal agencies that must also be overcome.

Ken Usiak asked if there would be coordination with other states. Don responded that SIEC has had discussions with Oregon's bordering states and have proposed that Oregon and Washington use a common system along the common border.

Don noted that as the state deploys new infrastructure and towers, that facilities also should be made available to private sector service providers and integrating commercial wireless services. Currently state owned facilities have restrictions on use by private sector companies. Sean McSpaden noted that there are also opportunities for local government to share facilities as well.

Don also indicated that they are looking at the use of private sector service providers for backbone redundancy to improve system reliability and reduce costs.

#### OWIN Project

- The Governor formed the State Interoperability Executive Council (SIEC)
- The SIEC Coordinators formed the State Wireless Infrastructure Investment Group as a subgroup of the SIEC in October of 2004

#### State Wireless Infrastructure Investment Group (SWIIG)

- SIEC Coordinators
- State Departments
  - o Administrative Services
  - o Corrections
  - o Emergency Management
  - o Forestry
  - o Military
  - o State Police
  - o Transportation
- Came up with a principles of agreement between state agencies
- Came up with a “system of systems” proposal for the SIEC
- Drafted a second Executive Order for the governor that later became a part of HB2101

SWIIG developed the concept for a “System of Systems” based upon upgrading the state’s analog microwave system to digital and in making radical improvements to the state’s communications buildings and towers

#### House Bill 2101

- Planning for a consolidated state system started with passage of HB2101.
- OWIN will consolidate state agencies onto a single radio system within OEM.
- OWIN will take on the state’s part of an SIEC interoperability solution.

#### Six Levels of Interoperability

- Level 1: Swap radios
- Level 2: Talkaround
- Level 3: Mutual Aid frequencies
- Level 4: Gateway/Console Patch
- Level 5: System specific roaming
- Level 6: Standards-based Shared Systems

Ann Steeves observed that these six levels refer to technical interoperability, and that attention also needs to be given to organizational interoperability such as chains of command, protocols, and terminology. Don responded that Project Safecom in the Department of Homeland Security addresses that very issue. He agreed that there is more to functional interoperability than communications networks and hardware.

He believes that the State and the Oregon SIEC should be looking at implementing a Level 6 system for the State and a Level 4 system for Statewide Interoperability -- establish interoperability between all state agencies and whoever else uses the consolidated radio system as the top level of interoperability – Level 6. It’s Don’s personal opinion that when the first engineering plans are released, many local governments will decide then to participate realizing that they will not be able to match its capabilities on their own.

#### Statewide basic infrastructure

Infrastructure: Consists of buildings, towers, digital microwave, emergency power, and security. There are currently 171 state communications sites. This number may be reduced with the new system.

## Statewide VHF P25 System

This is Level 6 Interoperability:

- Radio communications for state use
- Multi-vendor
- Migratable from current systems
- Migratable to future systems
- Completely standards based

SWIGG's mission -- Facilitate interoperability between all of the state's public safety agencies and jurisdictions by connecting different systems together by use of level 4

*Emergency Communications Virtual Private Network: SWIGG* knows that the statewide digital microwave system is the platform that can carry radio over IP to allow connection of disparate systems for interoperability.

Virtual Private Network (VPN) will be used:

- To use Internet Protocol
- To be completely self-contained and secure
- To use Commercial Off The Shelf Components - COTS
- To provide Level 4 statewide interoperability

Benefits of VPN

- Tie systems and equipment together
- Tie dispatch centers together
- Tie mobile and portable radio users into interoperability channels
- Tie mobile and portable radio users into other systems

Why do we need an interoperability layer?

- Gateways only operate where systems overlap
- Users can have radios on their home systems using any one of four different frequency bands
- No matter what kind of radio you have, the system must have a doorway to let you in
- The consolidation should reduce the total number of sites

Phase I – Consulting Services:

- Describe the current state of the State's existing wireless infrastructure
- Describe the future state of the infrastructure
- Complete conceptual designs of:
  - o Statewide digital transport system
  - o Statewide consolidated radio system
  - o Standardize buildings and towers
- Develop a business case document.
  - o Compare alternatives.
  - o Detail a phased implementation.
  - o Provide a high-level implementation plan.

- Develop the Statement of Work and mandatory and desired requirements for multiple construction RFPs. Work with DAS to complete RFPs.
- Inventory existing sites and systems
- Conduct a frequency assessment
  - o All frequencies currently used the State
  - o The State Use 700 MHz spectrum
- Determine “Core Sites” needed for the replacement radio system
- Compare coverage using “Core Sites” in VHF and 700 MHz bands
- Produce baseline coverage estimates of existing ODF, ODOT, and OSP systems by county
- Compare existing coverage for ODF, ODOT, and OSP and coverage of the replacement system
- Compare capacity, reliability, and risk assessment for the replacement system
- Complete a conceptual design for the replacement radio infrastructure
- Prepare a GAP analysis for DOC, ODF, ODOT, and OSP comparing existing systems and the conceptual system
- Business case: alternative approaches to phased implementation of radio system
- Recommend radio system architecture.
- Create a high-level implementation plan and a phase recommendation.
- Estimate timing of all phases
- Develop a SOW and the mandatory and desired elements for microwave, radio, and facilities RFPs.

#### 2006 Timeline

- April
  - o Needs assessment completed
  - o Sites surveyed
  - o Microwave design goals completed
- May
  - o Voice system coverage requirements
  - o Map current coverage by department
- June
  - o Tower usability assessment
  - o Core site recommendation
  - o Recommendation
    - o Trunked or conventional
    - o Digital or analog
  - o Statewide mobile data system
  - o System consolidation
  - o Report – frequency analysis
  - o Recommendation
    - o VHF or 700 MHz
  - o Core sites for interoperability
- July
  - o Statewide composite coverage maps
  - o Gap analysis for additional sites
  - o Conceptual design
  - o Physical plant
  - o Microwave system
  - o Radio system
- August
  - o Final site selection

- September
  - o Business case
- October
  - o High-level implementation plan
  - o RFP for frequency coordination
  - o RFP for design and construct contracts
- December
  - o Final report to Governor and Legislature

John Irwin observed that there is a lot of misinformation and confusion regarding the OWIN project, and there is a challenge to educate people around the state. There is an opportunity for greater outreach to the healthcare community for one. He invited SIEC to participate in the Oregon Connections Telecommunications Conference in October.

John congratulated the SIEC representatives on the level of effort they have expended on a very complex and challenging task. Sean McSpaden commented further on attempts to coordinate the work of SIEC with other related projects such as Multnomah County’s emergency planning effort, the state’s Computing and Networking Infrastructure Consolidation (CNIC) project, and the Integrated Wireless Network (IWN) project. SIEC plans to make the reports of its consultants available for examination. He noted that it is too early to say to what extent the CNIC and OWIN projects might be integrated.

John Irwin noted that there has been much improvement in Oregon’s telecommunications infrastructure and he is confident that there are opportunities for public safety networks to make use of that infrastructure. He also observed that by having a robust public safety infrastructure is also important for economic development.

Ed Parker added that a needed addition to any legislation for the network is to provide the opportunity for multiple uses and benefits. There are many communities in the state that will not be able to economically justify the construction of more than one broadband network. It is important that both public and private applications be allowed when that network is deployed. Doug Cooley, CenturyTel, added that public agencies are often anchor tenants in rural communities and are important to the incumbent service providers. He is also concerned that the new network would be paid for in part by a tax on telecommunications services, which would in effect put his company in the position of funding a competitor. Don Pohl responded that there is no intent for agencies to displace any commercial services currently subscribed to with the new system. He also said they are looking for co-location opportunities with private sector service providers. Jeff Johnson noted, however, that taxes on telecommunications services might well be proposed as a financing option.

Jeff added that SIEC has also been exploring interim solutions to improve communications for public safety.”

### SIEC Core Site Identification and the OWIN Conceptual Design

The Oregon Wireless Interoperability Network (OWIN) has received an initial draft of a major project deliverable from its engineering consulting firm, Federal Engineering. Chief Jeff Johnson issued a request for comments on July 18, 2006.<sup>26</sup>

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<sup>26</sup> “Core Site Identification and the OWIN Conceptual Design,” Memo to SIEC Members and Interested Parties, Chief Jeff Johnson, Chair State Interoperability Executive Council, July 18, 2006

“You are invited to comment now on the project deliverable, which identifies: 1) the core sites identified to support the goal of 95% coverage by county (mobile radio coverage) for the entire state; and, 2) the goal of increased coverage for state agencies by consolidation of state sites into OWIN.

The purpose of the review is to:

- o Give all Oregon entities a chance to evaluate how OWIN sites might be of use to them;
- o Allow the suggestion of alternate sites that might benefit OWIN and local agencies;
- o Insure the integrity of OWIN planning efforts and underlying presumptions;
- o Provide clear expectations of the opportunities and impact of site selection on localities; and
- o Allow timely completion of the OWIN conceptual design.

### **Background on Core Site Selection and SIEC Policy**

In February 2006, the State of Oregon entered into a contract with Federal Engineering to provide the State with conceptual designs for: 1) a single radio system to replace the four existing, independent state systems; 2) a microwave, radio tower, and communication building infrastructure that would allow consolidation of state public safety radio systems and provide capabilities for interoperable public safety communications by all public safety entities in Oregon (*per House Bill 2101, 2005 Oregon Legislative Assembly*).

Given that state agencies will rely upon this common infrastructure, a high level of state agency interoperability would thus be achieved. As important, public safety providers at all levels of government will have an opportunity to participate, in both the development and use of the statewide system.

To review the complete list of Federal Engineering project deliverables, go to the State Interoperability Executive Council (SIEC) website at <http://egov.oregon.gov/SIEC/>.

### **The SIEC’s Interoperability Interests and Policy**

The SIEC has adopted many policies intended to support local, state, federal and tribal governments’ ability to effectively communicate – not just in times of crisis – but day to day.

Consistent with its mission to facilitate statewide public safety interoperability, the SIEC adopted a policy in support of a “system of systems” architecture, meaning the OWIN infrastructure will be designed to be compatible with existing public safety radio systems. To the extent possible, system design will utilize existing infrastructure.

Except for agencies of the state, no unit of government is mandated to use OWIN or take advantage of the planned infrastructure. The state is in dire need of upgrading its own public safety communications system, most of which is out of production and at severe risk of failure. The extent to which the state-planned and state-financed infrastructure is to be used by local, tribal, and federal jurisdictions will be self determined.

The core sites identified provide a unique opportunity for governments at all levels to collaborate. Moreover, OWIN provides an opportunity for increased communications for public safety providers and the citizens they serve. The SIEC and system planners are mindful of the opportunity presented by anticipated infrastructure to be a catalyst for statewide interoperability.

The OWIN communication system will provide interoperability through federally designated interoperability channels that will be maintained and made accessible for all mutual aid and other emergency uses. It also presents three other major considerations for local governments:

One is the ability to co-locate local radio systems within the state site infrastructure (buildings and towers) – sharing a secure, reliable and technically advanced infrastructure to protect radio system investments;

The second opportunity is to opt to subscribe to the communication system built and operated through the OWIN program. Much like a cellular carrier provides service infrastructure service to individual phones, OWIN could provide such infrastructure service to others. In this case, the operation and maintenance of the system is left to the provider of the service - OWIN.

Lastly, local infrastructure investments may be coordinated with the OWIN system to expand the capabilities of the OWIN system, as local entities make independent investments to provide necessary local radio signal coverage that the OWIN system is not funded to provide.

Each of these examples are potential beneficial options for local entities.

The SIEC and OWIN are intent on providing access to site data for your review to build an awareness of the potential of these opportunities, and to provide the necessary information for the consideration of your public safety communication options.

Co-location and shared use of infrastructure are important principles of the SIEC as they are beneficial to the citizens of Oregon. The simple concept of co-location will help avoid costs for local and state governments in the development of infrastructure at core sites.

It is the SIEC's expressed goal to incent use of the OWIN system by public safety agencies, and the SIEC is committed to recommending such a policy to the Oregon legislature. However, the cost to participate in the OWIN system remains under development. Fees or subscription rates have not been determined, as too many cost factors are unknown at this time. The SIEC's finance policy regarding the OWIN system explicitly recognizes affordability and value for service as critical to the system's success. Toward this end, the SIEC is working on legislative concepts that would provide all levels of government and users of the system a permanent voice in governance and rate setting for the OWIN system (representative participation).

For more information on SIEC policy actions, see <http://egov.oregon.gov/SIEC/>.

### **Purpose and Utility of Core Site Data**

Core site data and the review process are vitally important to complete the work of producing the OWIN conceptual design. The conceptual design will be advanced to the

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SIEC, the Governor, and the Oregon Legislative Assembly to facilitate policy discussions about the need for – and cost of – investments in advanced public safety communications interoperability. The conceptual design will also be given to industry in the form of a Request for Proposal that will result in a design that meets the users' needs and to which the proposer will issue a guarantee of performance.

This review process will help determine if sites are available, if local alternative opportunities exist that will meet the infrastructure criteria, and to provide information vital to local public safety communication planning processes underway throughout Oregon. It will help evolve the OWIN plan, and it is hoped that it will assist in evolving local plans through a two way sharing of information.

The core sites identified by Federal Engineering are a detailed representation of the necessary infrastructure to provide radio signal coverage that meets design criteria on a statewide basis. The identified sites are presumed to be key to the overall operability and interoperability of Oregon's public safety communications. Most sites are currently owned and/or leased by the State. Some sites are owned by other entities (federal or local governments, special districts, or private parties).

Core sites need to provide room for basic infrastructure. In this case, infrastructure can be simply defined as the towers, the land or site, the secure buildings to house radio equipment, and the associated power systems for daily and emergency operation of the radio system.

The identification of core sites does not account for site-specific state or local government land use requirements or actions that may be required. The SIEC and OWIN program managers are mindful of the critical importance of siting and permitting issues, and the potential for project delays if not successfully addressed. Any knowledge you have about these issues as it relates to specific core sites is important information to share (for example, perhaps your jurisdiction owns or leases at an identified site, or is aware of access problems to a proposed site based on the experience of trying to acquire it for use in the past).

While it is anticipated that most core sites will become actual sites for the OWIN system, core sites identified in the conceptual design may not be final sites in the construction phase, and the potential exists to alter the conceptual design criteria as discussed below. The information you provide in this review could alter the need or desirability for specific sites. Given the expense of site development, a practical assessment of the benefit of coverage vs. cost for any locations that you will review would be valuable information.

While review of this information is helpful to the process of Federal Engineering's conceptual design, the importance of this information is longer term. Decisions, about what infrastructure will be built or not, will be made in 2007 for Phase One of the OWIN project. Of course, this is provided that legislative support is secured and that appropriations are made to support the OWIN project. Subsequent, Request for Proposals or other competitive bidding processes will be initiated in 2007, at a yet to be determined date.

What this means for your jurisdiction is that there is time in this process to consider and fully analyze the opportunities, potential, and impact of the core site information and the OWIN project overall. **The current core site review is not a final site selection process – it is an information gathering and sharing step in the process.**

## Coverage Requirements May Change

Achieving 95% statewide coverage by county for mobile radios is a goal of the SIEC. This planning requirement was given as a design requirement to Federal Engineering. Federal Engineering's work shows to all evaluators what that level of coverage would take. However, this ambitious requirement will lead to inevitable policy issues as costs of achieving the 95% requirement become apparent. Today the coverage of combined state radio systems provides about 84% statewide coverage, but it is not level 6 interoperability for state agencies, nor does it provide level 4 interoperability for all public safety agencies through gateway technologies. Because the 84% figure is the result of combining all state agency sites into the evaluation, no single state agency has even that level of coverage.

The preliminary work of Federal Engineering estimates that it would take a total of 365 sites to achieve that 95% by county goal. Achieving this level of coverage would not be practical because of its cost and the complexity of obtaining that number of sites. Therefore, the goal of OWIN is to look at the greatly increased level of coverage to all state agencies and to the interoperability network by the consolidation of state and other sites. The preliminary projection for the minimum number of sites that would best reach operability and interoperability goals within original project cost estimates is 183 sites. These 183 sites are a composite of existing state sites, some sites that the state identified as providing high levels of coverage, and some sites that were identified as being owned by other agencies through the FCC's records.

Program managers of OWIN and members of the State Wireless Interoperability Investment Group are considering these emerging issues as Federal Engineering finalizes analysis and identification of core sites.

**For the purpose of your review of the sites, also evaluate the potential for change in the coverage requirement, downward, that will reduce the number of core sites necessary for the OWIN system.** To achieve a change in coverage will require an alternate methodology for deselecting some "non-critical" sites. If this is deemed necessary, a transparent and inclusive step that allows these decisions to be made will be incorporated into the OWIN design process, and subject to SIEC policy discussions.

It is expected that comments resulting from the review process will provide information helpful to determining which sites are of greatest importance, and those of less importance, for both operability coverage and for interoperability purposes.

### Core Site Review Deadline

Federal Engineering is under contract to complete its final report in October of 2006. By necessity, it is an ambitious undertaking on an intense timeline with defined deadlines. The window for comments on core site identification, therefore, is necessarily short.

The two-week comment period will extend from July 18 to July 31.

It is essential that comments are received within this time period to allow the contractor to meet stringent deliverable timelines without additional costs of delay. It is also important to not just say that something is not workable without also including an assessment of what would be workable.

### Access to Core Site Selection Data and Solicitation of Comments

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Your comments are important to the success of this project -- and in providing information that will assist the resolution of policy issues currently under consideration.

The core site data files are quite large so it is impractical to email them to you. The files are posted on a website for your review. You may request access to the information by sending an email request, along with your contact information, to Sean McSpaden at [Sean.L.McSpaden@state.or.us](mailto:Sean.L.McSpaden@state.or.us).

As you review the core site information, please be thinking about the following:

1. Does the site present a co-location opportunity?
2. Do you own or use an alternative site, not identified as a core site, that should be considered for use by the OWIN system (sites must eventually meet technical criteria)?
3. Based on your site-specific knowledge and experience, what information can you share about a site that is not included in the data files (permitting and other issues)?
4. Given your experience providing public safety services in your area, are there proposed sites that are you do not regard as essential for coverage in your jurisdiction? What is your sense of the priority of site development and associated signal coverage (this will help establish priorities, as cost becomes a consideration)?
5. Given the proposed distribution of sites and associated signal coverage, does your jurisdiction have an interest in exploring opportunities to become an OWIN subscriber?
6. How do the proposed core sites impact/affect local interoperability plans you have or are developing?

We also welcome any other information about the sites that you believe is important for consideration.

Please submit your comments to the SIEC Technical Committee Chair, Sean McSpaden, at [Sean.L.McSpaden@state.or.us](mailto:Sean.L.McSpaden@state.or.us).

### **Questions in the Meantime**

If there are questions:

- About the underlying data, contact John Murray at Federal Engineering: [jmurray@fedeng.com](mailto:jmurray@fedeng.com)
- About SIEC policy actions, contact Marla Rae or Steve Marks: [marlarae@qwest.net](mailto:marlarae@qwest.net) or [steve@marksnetwork.com](mailto:steve@marksnetwork.com)
- About OWIN, contact Don Pfohl: [Donald.pfohl@state.or.us](mailto:Donald.pfohl@state.or.us)
- About the upcoming SIEC Technical Committee, contact Sean McSpaden: [Sean.L.McSpaden@state.or.us](mailto:Sean.L.McSpaden@state.or.us)

### Highlights of the FE Core Site Identification and the OWIN Conceptual Design

- *FE* completed engineering estimate on specific completed engineering estimate on specific sites needed to provide 95% coverage of Oregon sites needed to provide 95% coverage of Oregon by county for VHF band

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- *FE*'s work included:
  - Existing State sites
  - Existing State sites – State suggested sites
  - State suggested sites – FCC licensed sites
  - FCC licensed sites – Arbitrary sites
- The result establishes the ceiling for future The result establishes the ceiling for future considerations for growth of the OWIN system
- The net result for 95% coverage is 365 sites.

95%		96%	97%	98%	99%
Baker	Josephine	Clackamas	Clatsop	Benton	Yamhill
Columbia	Lane	Crook	Klamath	Deschutes	
Coos	Lincoln	Hood River	Lake	Multnomah	
Curry	Malheur	Jackson	Morrow	Washington	
Douglas	Marion	Linn	Wasco		
Gilliam	Polk	Sherman			
Grant	Tillamook	Union			
Harney	Umatilla	Wheeler			
Jefferson	Wallowa				

**Figure 5 -- Coverage By County with 365 Sites**

### OWIN Reaction

- It is unreasonable to expect that OWIN can produce a 95% solution
- We need to do what will support state emergency response operability problems
- We need to do what will support solving interoperability problems
- We have the data from the engineering to look at reasonable alternatives

### What does this tell us?

- It establishes the ceiling of coverage for the entire state
- It lets us gauge levels of existing coverage for all users
- It identifies those sites that are most effective and those that are needed for specific coverage problems
- We see that all state agencies' coverage would be greatly enhanced by the consolidation of existing state sites
- We have a set of coverage shortages based upon user interviews and surveys
- Using 179 of the 365 sites will get us to about 88%, greatly enhancing emergency communications operability and communications operability and interoperability
- This number of sites is consistent with OWIN's estimates that were used to gauge estimates of the cost of OWIN
- Interoperability for all Oregon entities would be greatly enhanced by use of the same 179 sites

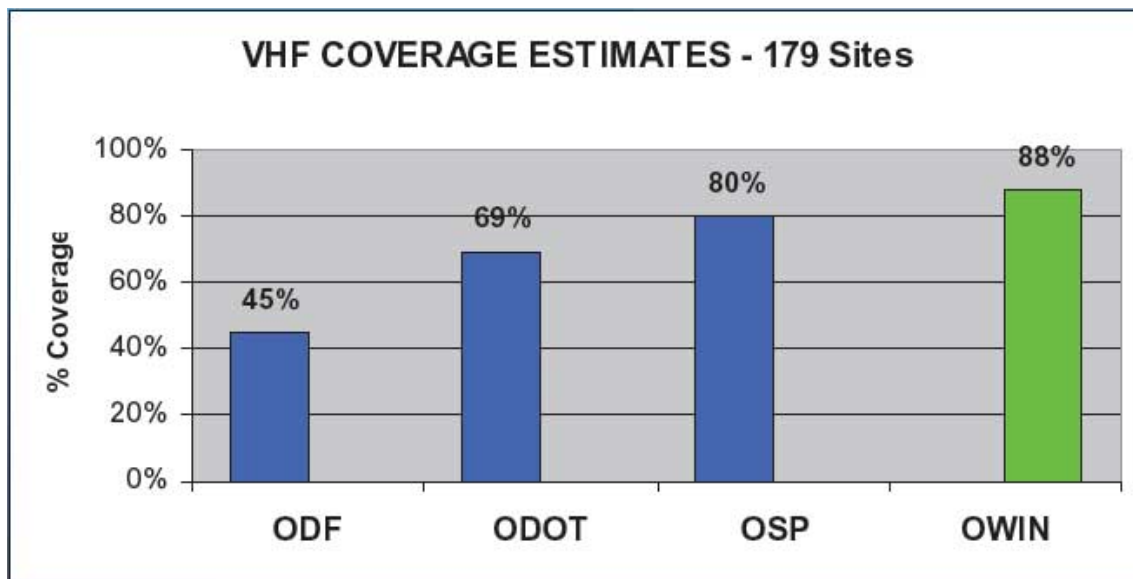


Figure 6 -- FE VHF Coverage Estimates

#### Next Work Products

- Using the *current site* information - confirm the coverage of the individual (existing) ODF, ODOT, and OSP systems. This establishes the baseline to gauge improved coverage by system consolidation and trunking
- Confirm proposed statewide coverage using the information of the 179 sites
- Determine the total increased coverage due to consolidation
- Include changes to core sites that occur during the comment phase
- Produce the microwave system conceptual design based on the 179 sites
- Include any coverage changes that are needed as a result of any local interest co-location or use of the OWIN system
- Develop coverage estimates for 700 MHz voice and data systems
- Develop frequency plan(s)
- Develop accurate cost estimates for all OWIN phases based upon the 179 sites

#### Regional efforts

Health Resources and Services Administration (HRSA) Region 2 contractor Touchstone (Heather Robey and Julisa Espinoza) presented to the ORTCC<sup>27</sup> on the Regional Interoperability Planning Initiative (RIPI) for Benton, Linn, Lincoln, Marion, Polk and Yamhill counties.

#### “Purpose

- To provide the Oregon Telecommunications Coordinating Council (ORTCC) an overview of the HRSA Region 2 interoperability planning project

#### Outcome

<sup>27</sup> Touchstone Consulting Presentation, Minutes of the Oregon Telecommunications Coordinating Council, <http://www.ortcc.org/PDF/meetings/0506/052506Minutes.pdf>, May 25, 2006

- Shared understanding of and support for the RIPI process and outcomes

#### Major Challenges – Current state of interoperability

Through the National Task Force on Interoperability (February 2003) the public safety community identified what they believe to be the greatest challenges to achieving effective public safety wireless communications:

1. Incompatible and aging communications equipment
2. Limited and fragmented budget cycles and funding
3. Limited and fragmented planning and coordination
4. Limited and fragmented radio spectrum
5. Limited equipment standards

The SAFECOM Program was established to address these key issues.

#### Interoperability Continuum

- The RapidCom program tailored the assistance offering for each of the 10 high-threat urban areas serviced, like Boston, New York City, Houston, San Francisco, and Los Angeles, based upon that area’s current efforts and specific needs. A core objective in RapidCom was to provide the short-term assistance that supported and impacted the local urban areas long-term interoperability planning efforts.
- In addition, the RapidCom work resulted in the development of the Interoperability Continuum, a tool designed to help the public safety community and local, tribal, state, and federal policy makers address critical elements for success as they plan and implement interoperability solutions.
- These elements include governance, standard operating procedures, technology, training/exercises, and usage of interoperable communications.

#### Common Change Scenario

- Fragmented views of the “As Is” and Vision
- Many initiatives managed independently to solve problems
- Each individual accountable for their initiative

#### Successful Change Scenario

- Cohesive view of the “As Is” and Vision
- Fewest initiatives managed as portfolio to drive Vision
- Team accountable for portfolio of initiatives

#### Timeline: February through July

- Phase 1: Targeted Outreach & Stakeholder Input
  - o Gather stakeholder input to support session agenda design
  - o Convene Core Leadership Group to assist in recruiting participants to attend the regional interoperability session and provide any pertinent data that has been previously collected

- Phase 2: Summary of Key Regional Interoperability Challenges and Opportunities
  - o Consolidate all stakeholder input and data that has been collected
  - o Validate key challenges and opportunities with Core Leadership Group
- Phase 3: Regional Interoperability Session on June 16th from 9am-3pm
  - o Discuss key goals and challenges
  - o Further define tasks to improve regional collaboration
  - o Set up ownership for the continuation of this effort without contractors
- Phase 4: Going Forward Sustainability
  - o Establish criteria to review CLCIP technical recommendations
  - o Implement appropriate technical recommendations
  - o Develop policy/process
  - o Design and conduct training and tabletop exercises
  - o Define financing strategies.

#### Desired Outcomes

- The RIPI will deliver the following outcomes for Region 2:
  - o Regional planning principles and criteria
  - o Identified challenges, resources, and opportunities that can be leveraged across the region
  - o Increased relationship building among public health and public safety stakeholders

#### Summary:

- A Core Leadership Group has been formed to support and guide the Regional Interoperability Planning Project in order to ensure the best, most useful outcomes for this region are achieved.
- We are bringing together representatives from public safety and public health organizations in this region to discuss the regional interoperability plan going forward at a session scheduled for July 21, 2006, from 8:30 AM – 3:30 PM at Lebanon Community Hospital, Conference Rooms A, B, C, D Combined, 525 N. Santiam Highway, Lebanon, Oregon. ORTCC council members are invited to attend.

Please send any additional suggested participants to [Julisa Espinoza@sra.com](mailto:Julisa_Espinoza@sra.com) or call 202 449-7218.”

### **Southern Oregon Regional Communications (SORC)<sup>28</sup>**

Southern Oregon Regional Communications (SORC) is located in Medford Oregon and serves the population of the beautiful Rogue Valley. SORC is a combined emergency dispatch facility and Public Safety Answering Point (PSAP) for the Jackson County Oregon 9-1-1 lines. The Center is also a regional "drop point" for emergency information that needs to be given to Jackson and Josephine counties. This may include severe storm warnings or notice of a foreign

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<sup>28</sup> Southern Oregon Regional Communications (SORC), <http://www.sorc911.com/history.htm>, retrieved March 21, 2006. Additional information provided in an interview with Millie Tirapelle, Director, and other members of the SORC staff on March 7, 2006.

enemy attack. This information is received through the National Air Warning Alert System (NAWAS) radio channel that covers the entire United States.

SORC has a rich history, starting initially as a Fire Communications Center in 1973. In 1975, by resolution and support of the County Board of Commissioners, the Center became a combined, centralized communications facility that includes law enforcement dispatching under the organizational structure of the Jackson County Sheriff's Office.

Between 1976 and 1980, numerous other emergency service agencies joined the Center and implementation of the 9-1-1 emergency telephone system was initiated countywide. During this period, the financial and operational activities of the Center were under the guidance of the Jackson County Advisory Council, which was made up of representatives from each user agency.

In 1981, the Center was transferred from the Sheriff's Office and placed organizationally under the County Administrator. In the several years that followed, control of the Center became a hotly debated issue. This finally culminated in the drafting of an agreement allowed under O.R.S. 190.10, which, in turn, established Southern Oregon Regional Communications as a stand-alone public entity. In essence, this agreement enabled the user agencies of the Center to come together as one organizational public body providing its own control and direction of emergency communications services. This is accomplished under the Council, consisting of representatives from the political jurisdictions that act as a Board of Directors for SORC. The SORC User Board handles center operational activities and subsequent recommendations to the Council. This entity consists of representatives such as police and fire chiefs from user agencies of the Center as well as those agencies that respond within the jurisdictional areas served by SORC.

In 1997, SORC implemented the Clauson system of emergency dispatch and all dispatchers are now certified in Priority Medical Dispatch by the National Academy of Emergency Dispatch.

In April of 2000, SORC made a huge leap into the computer age with the addition of a Tiburon computer aided dispatch (CAD) system. This technology upgrade did away with the antiquated paper-based system, allowing for quicker and more effective use of user agency resources.

In November of 2001, the center was given a whole new look. The old furniture was replaced with new ergonomic furniture and a new computer based radio system from Motorola was installed, giving us even more communications flexibility.

Southern Oregon Regional Communications (SORC) receives 9-1-1 calls from the majority of Jackson County. There is one other PSAP (Public Safety Answering Point) in the county also located in Medford. If you live within the city limits of Medford or Ashland, your call will automatically be directed to Rogue Valley Consolidated Communications (RVCCOM).

SORC employs 16 dispatchers who work on a rotating shift basis. We are staffed 24-hours a day with at least 3 - 4 dispatchers on duty at a time. On most shifts two dispatchers are

designated as law dispatchers and two more as fire. Dispatchers also answer all incoming 9-1-1 calls.

As you are giving information to the call-taker, he or she is inputting that data into the Computer Aided Dispatch system or CAD. While you are on the phone with SORC you will most likely hear the call-taker typing in the background. When the dispatcher has received the appropriate information from you, he/she will then enter it into the CAD system. The CAD program has a database of all addresses in the county and will then send it to the computer screen of the appropriate law enforcement, fire or ambulance dispatcher with a recommendation of which agency and how many units to send. When the dispatcher receives this information, he will send tones via radio to the responding agency and over the air advise them what is taking place and the response code they should use in responding. The responding units will then advise SORC by radio when they are responding and when they are on scene.

SORC currently is underway with completion of a regional microwave communications infrastructure with the addition of Elk Mountain to the list of antenna structures. Communications will flow between the counties of Josephine and Jackson. As seen in the following map each county has a “ring” joined with a link between Mount Sexton and Elk Mountain. This provides for redundancy within the counties. The only segment, and a possible risk factor, is the single-threaded segment of the connection that will exist between Elk Mountain and Mount Sexton. With this infrastructure completed the region will benefit from very high availability for its public safety telecommunications.

### **Eastern Oregon Interoperability<sup>29</sup>**

Rob Meyers, from Condon, Oregon, gave a report on the creation of the Eastern Oregon Interoperability System, which is a system capable of linking together with other systems. Their initial strategy was not to overbuild existing systems, and not to duplicate effort and resources, it was to figure out how to make the existing systems work together to preserve the money that had already been invested in those systems. Mr. Meyers also reported on the creation of the Guardian Project which is an overlay of the hospital and rural medical facilities in 12 counties.

### **Interoperability Presentation By Lane County Sheriff Russ Burger<sup>30</sup>**

Sheriff Jim Swinyard, chair of the SIEC Partnership Committee, invited Sheriff Russ Burger to provide an overview of the efforts in the seven counties of Oregon’s Fourth Congressional District and the radio project that is developing. Sheriff Burger outlined the background of the project. He said funding came from an earmark in a U.S. Department of Transportation grant.

The project is planned in two phases. The first is installation of microwave connectivity links, construction of a Project 25 master site, and establishment of a system for interoperable communications for mobile units roaming in the district. The second phase is expansion of the VHF interoperable tactical channel.

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<sup>29</sup> Oregon State Interoperability Executive Council Minutes of Meeting, May 10, 2005, [http://egov.oregon.gov/SIEC/docs/SIEC\\_Meetings/SIEC\\_Minutes\\_05\\_10\\_05.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_Meetings/SIEC_Minutes_05_10_05.pdf), retrieved April 14, 2006

<sup>30</sup> Oregon State Interoperability Executive Council Minutes of Meeting, December 13, 2005, [http://egov.oregon.gov/SIEC/docs/SIEC\\_Meetings/SIEC\\_min\\_12-15-05.pdf](http://egov.oregon.gov/SIEC/docs/SIEC_Meetings/SIEC_min_12-15-05.pdf), retrieved April 14, 2006

Sheriff Burger said the system in the seven county area will not duplicate OWIN or IWN; rather, he said the system is planned to interface with those systems.

Sheriff Burger also offered whatever assistance he might be able to provide with the congressional delegation.

### **Health Alert Network<sup>31</sup>**

The Oregon Public Health Emergency Preparedness Program's Health Alert Network Program (HAN) is provided by the US Centers for Disease Control and Prevention (CDC) and reports to the Office of the State Deputy Public Health Director.

The Oregon HAN Program is part of the CDC National Health Alert Network System and is a key component of the Public Health Information Network (PHIN). The Health Alert Network (HAN) is an effort to improve public health preparedness among state and local public health agencies, hospitals, and tribes in Oregon.

- Public Health Information Systems Capacity
- Internet Connectivity
- Communications Systems
- Partner Communication and Alerting
- Disease Outbreak Reporting and Information.
- Disaster Preparedness Radio Systems
- Emergency Operations Center Technical Support

What they do

- Survey local health departments to assess IT/IS capacity and security related to public health.
- Distribute federal grant funds to purchase needed equipment, based on approved plans.
- Work with local health departments to improve the communications with the Oregon Public Health Division and local and state public safety agencies. We have established real-time, 24/7 communications capacity among the Federal government (CDC), the Oregon state health department, and every Oregon county health department.
- Coordinate with other Oregon State Public Health initiatives related to technology or infectious disease control, including the Acute and Communicable Disease Program (ACDP) and the Oregon State Public Health Laboratory (OSPHL)
- Collaborate with neighboring states to provide an interoperable framework of communication and disease reporting.
- Maintain the AlertOregon Notification System.
- Maintain the Oregon Public Health Division Virtual Joint Information Center (V-JIC).
- Manage the Oregon Public Health Division Agency Operation Center's (AOC) IT-Communications Platform.
- Work closely with the Laboratory Response Network (LRN) Platform to maintain a synchronized approach Chemical and Biological events.

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<sup>31</sup> Oregon Health Alert Network, <http://www.oregon.gov/DHS/ph/preparedness/han/index.shtml> , retrieved July 24, 2006

- Collaborate with Hospitals to maintain the Oregon Hospital Capacity Website.
- Provide a secure, access controlled Public Health Library and Strategic Emergency Response Plan Repository.
- Provide resources for the statewide all-hazards public health IT/IS contingency plan.

Since the beginning of the HAN project, significant improvements have been made by local health departments throughout the State. The Health Alert Network (HAN) is a nationwide initiative led by the Centers for Disease Control and Prevention (CDC). The goal is to ensure that all local and state health departments have access to the technology needed for rapid communications, disease reporting, and the dissemination of preparedness education and training. Federal funding has enabled this vision to become a reality in Oregon.

The Secure Oregon HAN Program is a joint collaboration between the Oregon Public Health Division and the Oregon Conference of Local Health Officials (CLHO). Together, the Oregon Public Health Division and CLHO operate a seamless system that can be accessed on a 24-hour, 7 days per week basis.

The HAN includes a number of data and communication tools, including a database of key health contacts and a system for rapidly disseminating health alerts. The HAN infrastructure enables distance education and training to be provided through a variety of technologies, such as satellite broadcasts, webcasts, interactive videoconferences, and on-line courses. HAN infrastructures will be adapted into Public Health Information Network (PHIN) compliant active and passive disease reporting / surveillance at the local, state, and national levels.

#### HAN presentation<sup>32</sup>

SIEC member Jeanne Arana introduced Eric Stewart, Technical Coordinator of Oregon's Health Alert Network (HAN). HAN is a project funded through a cooperative agreement involving the Centers for Disease Control and Prevention. Its purpose is to improve state and local responses to public health emergencies on a 24/7 capacity.

Eric said the network works with other state preparedness staff to integrate public health emergency communications procedures with relevant state, federal, and local agencies, as well as local health departments and relevant federal and non-governmental organizations, such as the Red Cross.

*[Editor's Note: Reasonable questions have arisen as to whether or not there is any regional/local data collection and reporting capability in place. Data is reported to the state via an online data entry session. The state then disseminates the information back to the region. Questions have arisen over the potential delays for GIS or other similar plotting of rapidly spreading pandemic-like related events -- for example, timely tracking of the dispersion of an outbreak as a means to identify possible containment, especially in the event of a telecommunications interruption. Uninterrupted telecommunications capabilities, based on route redundancy that ensures rapid dispersion of critical communications to and from public health departments as well as emergency rooms, law enforcement and EMT rise in importance. Ham radio operators, a historical bastion of support in times of emergency events, might fill a*

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<sup>32</sup> *ibid*, Oregon State Interoperability Executive Council Minutes of Meeting  
*Public Safety Guidelines for Oregon Policy Makers* Page (Draft for Discussion)  
 Revised: July 24, 2006

*temporary void. However, with the growth in the volume of data used to support such activities, ham radio likely would soon fall behind. Delivery of that information to public safety workers in the field could be critical to stemming the tide of a pandemic. Conversely, the ability of reports from the field, appropriately filtered, to be immediately posted and available in the region is of equal critical importance.]*

## **RCC Consultants<sup>33</sup>**

Tom Busam and Scott Johnson of RCC appeared before the ORTCC on May 25, 2006. They reported on RCC's involvement with certain counties in Oregon. They provided the following RCC Corporate Overview:

- Established in 1983, and today is the industry leader
- Independent and Objective, not affiliated with any vendor
- Nationwide Presence
- Offices and personnel nationwide
- Approx. 130 full-time staff
- Headquarters in Woodbridge NJ
- Industry Focus
- Public safety
- Critical infrastructure industries
- Services
- Consulting, Engineering, and Project Management
- Technology Expertise
- Wireless and wire-line communications systems, IT systems, architectural design support, regulatory and performance analysis support
- Website <http://www.rcc.com/>

RCC reports working with fifteen Oregon Project Counties to develop interoperability plans. The Counties are Clatsop, Crook, Deschutes, Hood River, Jefferson, Lake, Lane, Lincoln, Marion, Tillamook, Wasco, Benton, Linn, Polk, and Yamhill. Project timeline is 11 months. The focus is on the following interoperability issues:

- Need Operability before Interoperability
- Local First Responder
- Mutual Aid / Tactical
- State
- Federal

RCC is applying a process that includes:

- Interviews
- Questionnaires
- Site Survey
- Interoperability Matrix

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<sup>33</sup> RCC Consulting Presentation, Minutes of the Oregon Telecommunications Coordinating Council, <http://www.ortcc.org/PDF/meetings/0506/052506Minutes.pdf>, May 25, 2006

- Propagation Model
- Recommendation
- Estimation

Scott Johnson stated that OWIN is focused on state assets and RCC is focused on the local assets. RCC will be producing detailed asset inventories by fall 2006.

### Other Thoughts

Cell towers and other antenna structures are very susceptible to attacks and natural disasters, with long-term service interruption certainly to follow in either case. In addition to antenna structures being ruined in a disaster, cellular service can also be overwhelmed -- problems can arise from millions of music-loving TV-viewers using cell phones to cast electronic ballots for the latest *American Idol*. In a more ominous scenario, overwhelmed cellular communication systems can -- and have -- imploded into uselessness during large-scale emergencies and disasters like 9/11. As such it may be impractical, imprudent and perhaps even downright foolish for first responders to rely on cellular technology for data -- let alone voice and video -- transmission needs during an emergency situation.<sup>34</sup>

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<sup>34</sup> "No More Towers," Kris Middaugh, Government Technology, May 7, 2004, <http://www.govtech.net/magazine/story.php?id=90189>, retrieved April 3, 2006