



Public Safety Radio Communications on Tribal Lands: A Summary

Eastern Band of the Cherokee

Gila River Indian Community

Havasupai Tribe

Hualapai Tribe

Lummi Nation

Mescalero Apache Nation

Navajo Nation

Oglala Sioux Tribe

Puyallup Tribe

Quileute Tribe

Standing Rock Sioux Tribe

Yavapai-Apache Nation



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Preface

The Public Safety Wireless Network (PSWN) Program is jointly sponsored by the Department of Justice and the Department of the Treasury. Its mission is to promote effective public safety communications and to foster interoperability among local, state, federal, and tribal communications systems. With guidance from the Federal Law Enforcement Wireless Users Group and an Executive Committee that includes prominent local, state, and federal public safety officials, the program is addressing issues facing these agencies as they work to improve communications interoperability. The focus of the program's effort is on promoting partnerships among public safety agencies, conducting case studies in several regions of the Nation, initiating pilot projects to test and refine interoperability solutions, addressing spectrum policy and funding issues important to public safety, and investigating issues associated with system security and standards and technology development.

Previous case study efforts by the PSWN Program have focused on diverse areas of the country such as San Diego and Imperial counties in California; the southwest border region of the United States; the greater Salt Lake City, Utah, area; and the greater metropolitan Washington, DC, area. In these case studies, the program analyzed interoperable land mobile radio (LMR) communications opportunities by examining five key issues affecting interoperability—coordination and partnerships, funding, spectrum, standards and technology, and security.

Each of these studies expanded the knowledge base of the program in various aspects of implementing interoperable technical solutions. By working with local, state, and federal agencies in the case study locations, the PSWN Program gained insight and shared a vision for seamless, coordinated communications. With the overarching mission to assure that no man, woman, or child should ever lose his or her life because public safety responders could not communicate with each other, the PSWN Program conducted a number of activities in each of these case studies, including: data collection, data analysis, test system development, demonstrations, pilot projects, and initial interoperability assistance. The results provided the baseline knowledge necessary to develop best practices, innovative designs, integrated solutions, standard operating procedures, and other critical system information.

Because the program's baseline knowledge of interoperability impediments is drawn from assessments of local, state, and federal agencies, the program undertook an assessment of Native American tribal nations. The additional perspective and experiences gleaned from an assessment of tribal nations will enhance earlier findings and provide a baseline regarding public safety communications on tribal lands.

1. Introduction

The Public Safety Wireless Network (PSWN) Program, as part of its overall mission, conducts communications assessments of various agencies, jurisdictions, and regions targeted at providing details regarding the current state of interoperable communications of public safety agencies throughout the country. Because these assessments identify interoperability barriers, they are key steps toward achieving long-term interoperability among public safety agencies. Past assessments focused on local, state, and federal public safety agencies. However, the Public Safety Radio Communications on Tribal Lands assessment concentrates on wireless radio communications for tribal nations. These wireless radio communications include those of tribal, local, state, and federal agencies, as well as any private organizations supporting tribal nations land mobile radio (LMR) communications.

The specific objectives of the Public Safety Radio Communications on Tribal Lands assessment were to—

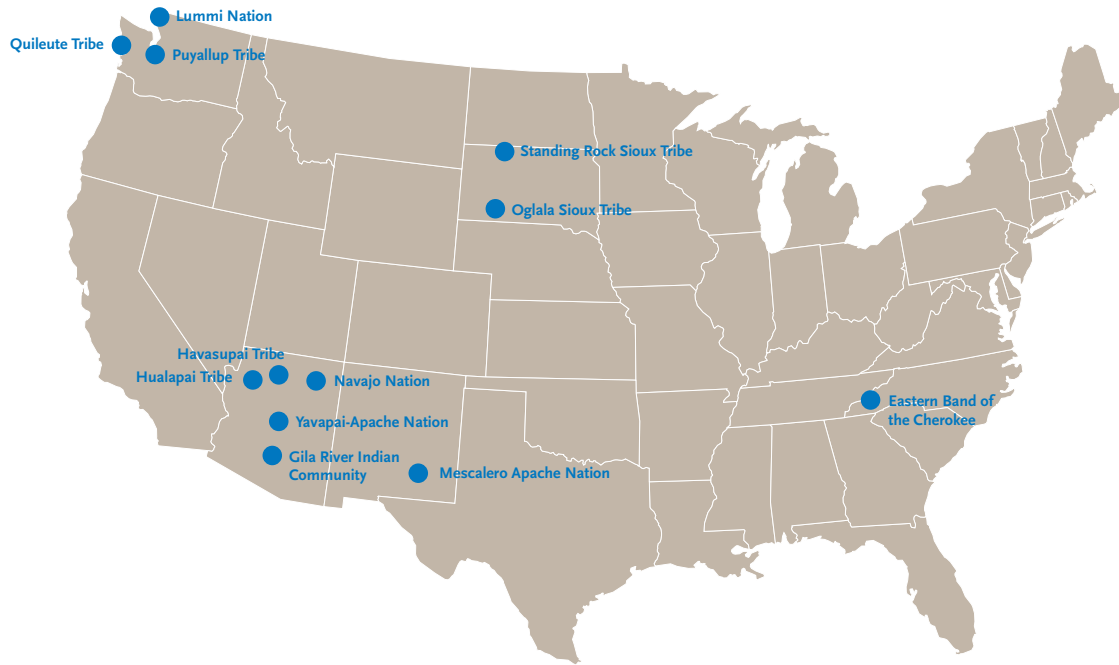
- Develop a baseline of tribal communications capabilities
- Determine basic tribal LMR user requirements
- Identify agencies with which each tribal nation needs interoperable communications
- Identify public safety agencies serving the selected tribal nations
- Identify impediments to tribal communications interoperability.

The PSWN Program initiated the Public Safety Radio Communications on Tribal Lands assessment in April 2001. By working with the Bureau of Indian Affairs (BIA) and attending national conferences with tribal members, the program selected 12 tribal nations to assess—

- Eastern Band of the Cherokee in North Carolina
- Gila River Indian Community in Arizona
- Havasupai Tribe in Arizona
- Hualapai Tribe in Arizona
- Lummi Nation in Washington
- Mescalero Apache Nation in New Mexico
- Navajo Nation in Arizona
- Oglala Sioux Tribe in South Dakota
- Puyallup Tribe in Washington
- Quileute Tribe in Washington
- Standing Rock Sioux Tribe in North and South Dakota
- Yavapai-Apache Nation in Arizona.

Figure 1 below shows the location of each of these tribes.

Figure 1: Tribal Nations Selected for Assessment



Because the program understands that each tribal nation in the United States is unique in culture and needs, the tribal nations selected for this public safety communications interoperability assessment are not intended to be representative of all tribal nations in the United States. However, the program did identify recurring themes representing conditions adversely affecting interoperability for many of the tribal nations.

The balance of this report includes the following:

- Section 2 describes the methodology the assessment team used to collect the data.
- Section 3 summarizes key topic areas that directly influence public safety communications use, such as population, area served, and diversity of terrain, comparing the assessed tribal nations.
- Section 4 provides an overview of the state of LMR communications for assessed tribal nations and their ability to communicate with the agencies with which they require interoperability.
- Section 5 draws some conclusions regarding the success of the assessment and how the individual reports can help the assessed tribal nations understand their current LMR infrastructure, correct any LMR infrastructure deficits, and meet their interoperability challenges.

2. Methodology

This section details the approach for the Public Safety Radio Communications on Tribal Lands assessment. The interoperability assessment team performed the following steps in collecting data from tribal, local, state, and federal public safety agencies, as well as private organizations supporting or using LMR communications in the selected tribal nations:

- Established information profiles on selected tribal nations
- Contacted and held introductory meetings with selected tribal nations
- Established tribal, local, state, Federal Government, and private organization points of contact with selected tribal nations
- Interviewed agency or private organization radio managers, command staff, and systems users within the tribe, as well as selected local, state, and federal agencies that interoperate with the tribe
- Documented interview responses
- Performed engineering, policy, and other analyses.

2.1 Information Profiles on Selected Tribal Nations

The Public Safety Radio Communications on Tribal Lands assessment presented unique challenges to the PSWN Program. The PSWN Program has significant experience working with the public safety community at all levels of government; however, the program identified tribal nations as a segment of the public safety community not previously assessed. To properly prepare for the data collection, the data collection team created a profile for each tribal nation. The profile included information such as demographic data, relevant news articles, geographic data, historical information, and public safety frequency data pertinent to the particular tribe being assessed.

2.2 Introductory Meetings With Selected Tribal Nations

The first step in the interoperability assessment was to send an introductory letter to the selected tribe soliciting its interest in and assistance for the assessment. After the tribe had indicated its willingness to participate in the interoperability assessment, PSWN Program support staff scheduled an introductory meeting on tribal lands. PSWN Program representatives and support staff met with each tribe in advance of the data collection.

The purpose of the introductory meeting was to allow the PSWN Program to explain the program's mission and the goal of the assessment. This was also an opportunity for the PSWN Program to collect more detailed information on which agencies provided public safety services to each tribal nation. Once they identified these agencies, the PSWN Program representatives asked several questions about the tribe's experience with its LMR system and local, state, and federal public safety LMR interoperability.

These introductory meetings were instrumental in gathering background data not available through other means and in helping build the relationships needed to successfully complete the data collection.

2.3 Tribal, Local, State, Federal, and Private Organization Points of Contact Supporting Selected Tribal Nations

The introductory meetings provided an excellent starting point for the data collection. In many cases, the meeting participants developed a list of tribal, local, state, federal, and private organizations to interview regarding interoperability. PSWN Program staff worked with the tribal agencies to obtain contact names and numbers of each identified agency and private organization to schedule interview appointments. The assessment team contacted the identified agencies to set up appointments before traveling to tribal lands. This initial contact gave PSWN Program staff an opportunity to introduce the non-tribal agencies to the PSWN Program effort, solicit their cooperation, and arrange a convenient interview date and time.

2.4 Radio Manager, Command Staff, Systems User, and Private Organization Interviews

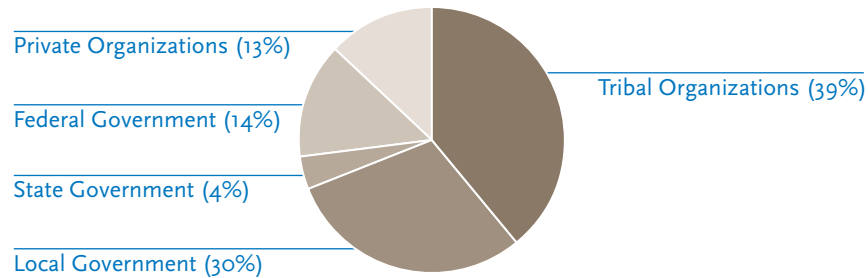
The assessment team members developed a detailed list of questions for use in the interoperability assessment interviews. These questions focused on identifying the data needed to support technical, funding, coverage, security, and spectrum analyses. The questions were grouped logically into two interview guides tailored for use by radio managers and systems users, respectively. In addition, a command staff guide was developed to assist in gathering general agency information. The team designed the interview guides to facilitate consistency in responses from all agencies and the timely completion of interviews.

The data collection teams completed a total of 344 interviews. Table 1 provides a breakdown of the completed interviews by mission area.

Table 1: Interviews by Mission Area

Tribe	Fire/Rescue/EMS	Law Enforcement	Other Govt. Agencies	Private Organizations
Eastern Band of the Cherokee	41	14	12	3
Gila River Indian Community	15	9	7	12
Havasupai Tribe	1	4	6	5
Hualapai Tribe	6	7	9	6
Lummi Nation	0	12	1	1
Mescalero Apache Nation	3	4	3	7
Navajo Nation	9	13	2	3
Oglala Sioux Tribe	15	14	2	2
Puyallup Tribe	7	19	4	3
Quileute Tribe	2	10	1	1
Standing Rock Sioux Tribe	5	7	22	4
Yavapai-Apache Nation	1	5	2	3
Total	105	118	71	50

Figure 2: Percentage of Interviews by Organization



Interviews were held with representatives from different levels of government, as well as private organizations. Private organizations included radio maintenance vendors and private emergency medical services (EMS) providers. Figure 2 represents the percentage of interviews by organization.

In general, gathering user information from police officers, paramedics, and firefighters was straightforward. However, collecting radio manager-type data was more challenging. Unlike the user guide, which contained questions regarding the user's experiences with the equipment and system, the radio manager guide questions solicited substantial technical, funding, and system planning data. That level of detailed information was not available because in all cases, the radio manager worked for a private LMR maintenance organization that had little insight into LMR planning and funding issues for the tribal nation. In many cases, these LMR vendors provided technical data from memory. In those cases where the team members could not obtain detailed system data for tribal systems or the agencies with which they interoperated, the team relied on appropriate federal frequency database information.

In cases where it was not practical to meet with non-tribal agencies face to face, data collection team members contacted these agencies by telephone in an attempt to obtain the necessary information regarding interoperability.

2.5 Interview Responses

Team members documented responses to interview questions on printed copies of the interview guides. The team created a binder for each tribe to allow the team to maintain completed radio user, manager, and command staff guides, as well as the information profile on each tribe. This binder also contains any additional information obtained during the data collection process. To support statistical queries and to archive interview responses, the team entered all the information collected in the interview guides into a database collection tool.

3. Background

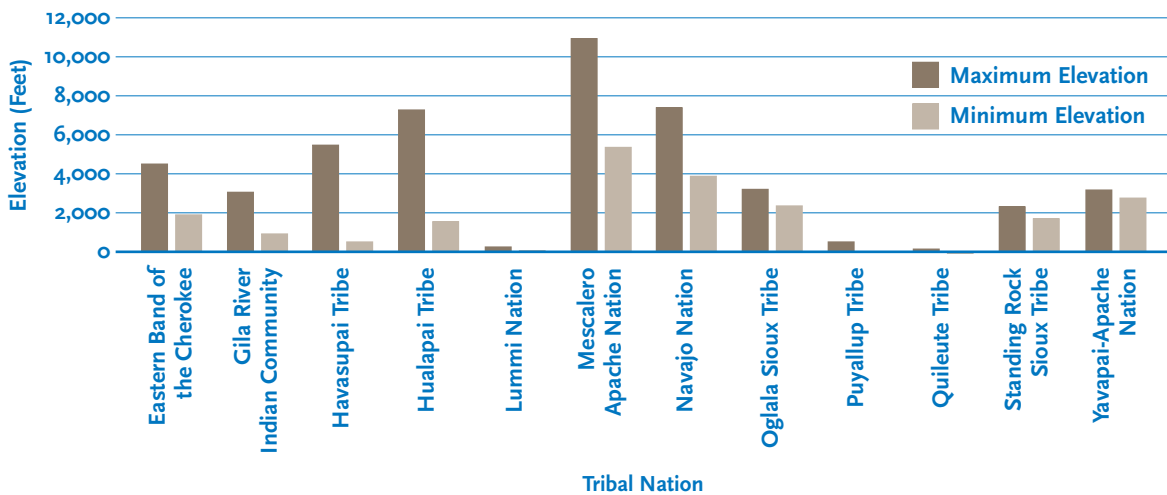
This section provides background data on the geography, demography, and public safety services provided at each of the tribal nations assessed.

3.1 Geography

The majority of the assessed tribal nations are located in relatively remote areas of the country, as demonstrated by their close proximity to national parks (NP) like the Bad Lands NP in South Dakota, Grand Canyon NP in Arizona, Great Smoky Mountains NP in North Carolina, and the Olympic NP in Washington State. The specific environment of the assessed tribe varies from rural and remote to urban. For example, the almost inaccessible Havasupai Tribe in Arizona is located in the Havasu Canyon and is surrounded by 3,000-foot canyon walls. The reservation is only accessible by helicopter, or by foot or by horse via an 8-mile trail. In contrast, the Puyallup Tribe is located approximately 30 miles south of Seattle and is next to the City of Tacoma, an urban city with almost 200,000 residents.

The terrain and size of the assessed tribal nations vary considerably by nation. The terrain at a majority of the tribal nations has considerable elevation variances. Figure 3 provides minimum and maximum elevations for each tribal nation. The Hualapai Tribe, Havasupai Tribe, and the Mescalero Apache Nation have elevation variations of 5,000 feet or more on their respective lands.

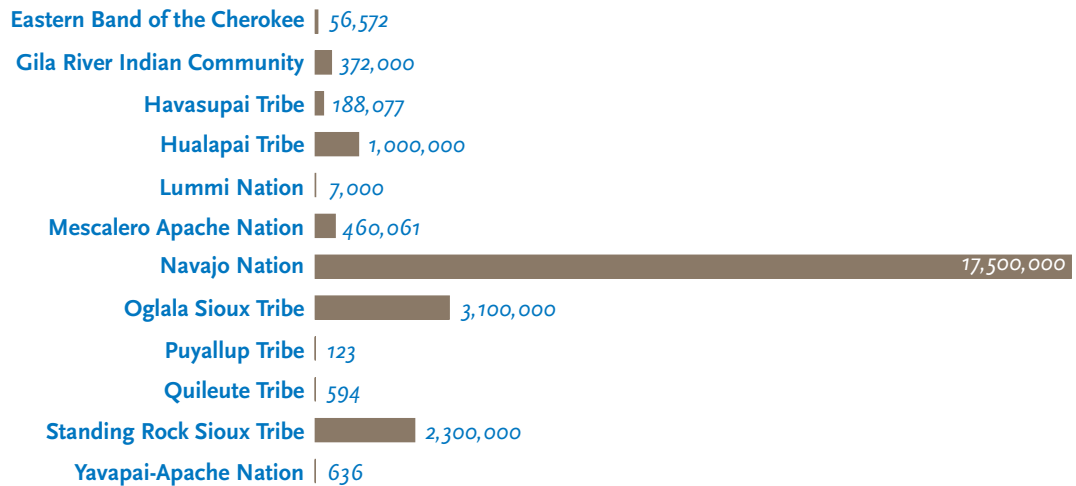
Figure 3: Elevation Variances for Tribal Nations



The variations in elevation challenge public safety personnel in unique ways, such as requiring patrolling remote areas and performing search and rescue work in rugged terrain. These elevation variations can also contribute to a lack of LMR coverage for public safety personnel.

The physical size of the assessed tribal nations varies from Navajo, the largest reservation in the United States, at 17.5 million acres, to 123 acres for the Puyallup Tribe. Figure 4 provides an overview of the land mass differences for the assessed tribal nations.

Figure 4: Land Size (in acres) for Tribal Nations



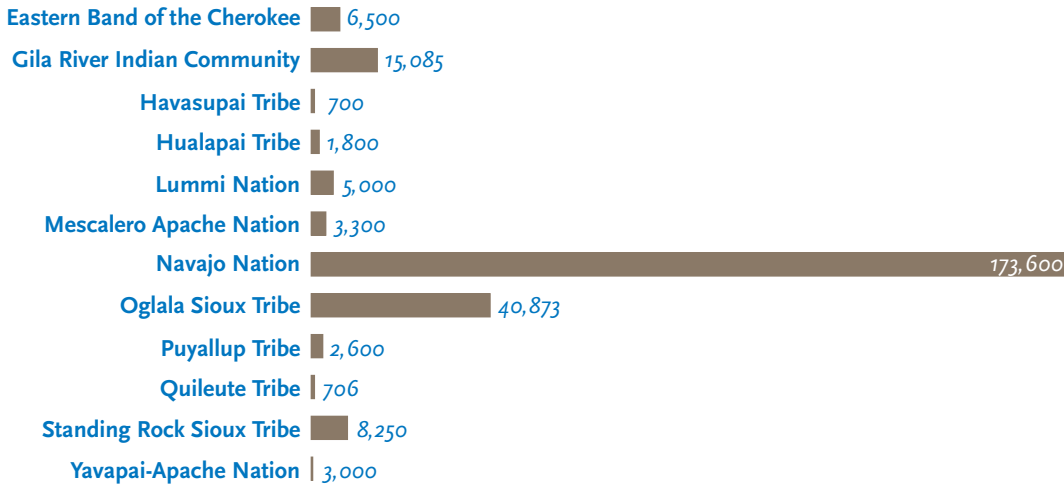
Despite the varying size of the tribal lands, many of the tribal nations experienced some of the same public safety communications difficulties, such as inadequate radio coverage.

3.2 Demography

A tribal council governs each assessed tribal nation. The number of council members is usually a factor of the population of the nation, and for the tribal nations included in this assessment, council sizes range from a 5-member council for the Puyallup to an 88-member council for the Navajo Nation. Population size varies among the tribal nations and has no correlation to the physical size of the tribal nation's land mass. Assessed tribal nations' populations are approximate and may include non-Native Americans as well as Native Americans living on tribal lands.

Population figures vary from 700 for the Havasupai Tribe to almost 174,000 for the Navajo Nation. Figure 5 provides an overview of the population differences in the assessed tribal nations.

Figure 5: Population Estimates for Tribal Nations

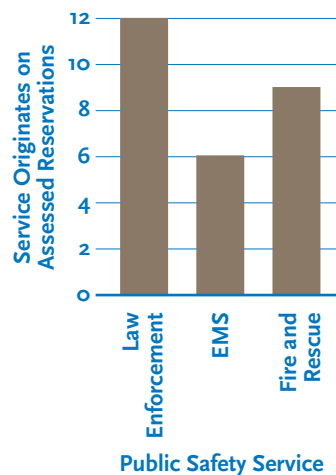


Principal economic activities for the assessed tribal nations have two themes: gaming and/or recreational use of the land, such as hunting, hiking, or camping. Tribal nations such as the Standing Rock Sioux, Lummi, and the Yavapai-Apache have casino operations to help support funding initiatives. Tribal nations such as the Havasupai, Hualapai, and the Mescalero Apache all support businesses that provide visitors opportunities to enjoy the activities available on their land. The Havasupai have scenic falls and hiking trails, the Hualapai have guided hunting expeditions and rafting trips down the Colorado River, and the Mescalero Apache have ski trails. Many of the tribal nations also derive income from agricultural activities such as timber and farming, as well as from sales of arts and crafts.

3.3 Public Safety

The assessed tribal nations provide different public safety services on tribal lands. For 50 percent of tribes assessed, law enforcement, fire and rescue, and EMS functions originate on tribal land. Figure 6 provides an overview of the public safety operations originating on tribal land.

Figure 6: Public Safety Services Originating on Tribal Land



3.3.1 Law Enforcement

In every case, law enforcement services are provided. In most cases, BIA provides these services, but several tribal nations (e.g., Eastern Band of the Cherokee, Gila River Indian Community, and the Quileute) have their own police departments. The number of personnel assigned to support law enforcement activities varies and depends on population, demand, and very often, funding. Law enforcement staffing varies from 5 officers for the Quileute Tribe to approximately 300 for the Navajo Nation.

The PSWN Program found that several tribal nation law enforcement agencies had multijurisdictional law enforcement endorsements. For example, the Yavapai-Apache Police Department maintains tribal, State of Arizona, and BIA federal jurisdictional powers allowing them to arrest and process Indians as well as non-Indians anywhere in the State of Arizona. Other departments such as the Gila River Indian Community and the Puyallup Tribe enjoy additional local law enforcement powers.

Depending on jurisdictional issues and the nature of crimes committed, the tribal nation may rely on assistance from Federal Government agencies like the Federal Bureau of Investigation (FBI).

3.3.2 Fire and Rescue

Ten of the 12 assessed tribal nations provide some type of fire and rescue service. The level of service depends on whether BIA provides the service or the tribe has its own fire and rescue department, and funding limitations. In some cases, BIA provides wildland fire protection, and the tribal nation provides structural fire protection.

The range of fire and rescue service levels varies from no fire and rescue service functions at the Havasupai, Lummi, and Puyallup, to very limited fire protection at the Quileute, to fully staffed operations at the Gila River Indian Community and the Eastern Band of the Cherokee.

3.3.3 Emergency Medical Services

Only 50 percent of the assessed tribal nations have EMS available on tribal lands. Where the tribe has EMS, the tribe provides it. In no case does BIA provide EMS other than Indian Health Service functions, which do not provide for emergency response and transport services for the sick or injured.

To the tribes' credit, the level of EMS available are at the paramedic or cardiac care level. This assures that the care of advanced illnesses (e.g., heart attack) and injuries are handled aggressively, with the appropriate level of advanced monitoring and drug management only available to advanced EMS providers. Given the remote locations of many of the tribal nations, EMS providers routinely depend on medical evacuation services provided by either private medical helicopters or in some cases, state-provided helicopters.

3.3.4 Public Safety Summary

The assessed tribal nations have a law enforcement presence available in all cases but, to some degree, lack fire and rescue service and to a large degree, lack an EMS presence. Because public safety services available on some tribal lands are limited and/or because a major emergency incident depletes the resources of fully staffed tribal public safety agencies, the tribal nations must rely on assistance from other agencies.

Assistance from outside agencies might include other tribes, local, state, or federal government agencies. Coordinating the response of these outside entities requires adequate radio communications. Section 4 provides an overview of the state of LMR communications for assessed tribal nations and their ability to communicate with the agencies with which they require interoperability.

4. Key Findings

The key findings of the Public Safety Radio Communications on Tribal Lands assessment cover seven areas—

- **LMR Infrastructure**
Design, condition, age, and performance of the components of the existing system
- **LMR Subscriber Equipment**
Performance, functionality, condition, and age of mobile and portable radios
- **Commercial Services**
What commercial services are used or needed
- **Wireless Data**
What types of wireless data applications are used or needed
- **Security**
What security features (e.g., fences, locks, and radio encryption) are used or needed
- **Interoperability Requirements**
Status of agencies with which the tribal nations require interoperability
- **Financial Considerations**
What costs are being incurred to maintain the system, what funds are used to support the system, and what plans exist for procuring equipment.

Key findings of the data collection are detailed in the following sections with technical topic areas first, followed by policy or management related topics.

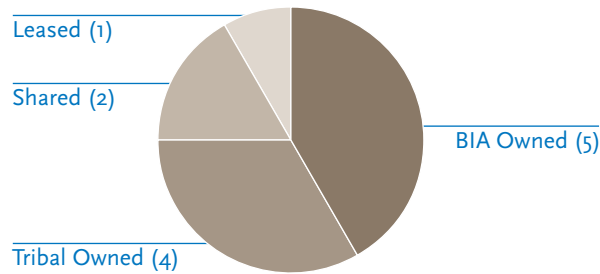
4.1 LMR Infrastructure

Every assessed tribal nation uses LMR communications to support public safety operations. For the most part, these tribal nations are operating in the very high frequency (VHF) band. In fact, 10 of the 12 tribes use the VHF band, and the remaining two use the ultra high frequency (UHF) band. The LMR systems are owned by the BIA, the tribe, or leased from a third party. Few systems are actually owned by the tribal nations themselves. Five tribal nations are operating on BIA LMR systems, four operate on systems owned by the tribal nations themselves, and three operate on a third party's system on a contractual basis. In the situations where the tribal nations have a contract to use a third party's system, two nations share law enforcement only systems with local government. The third tribal nation is leasing a system from a private vendor.

In many of the cases where there is a BIA presence, it is important to note that although system ownership might be clear, the frequency licenses or assignments, and the maintenance and repair responsibilities, did not always follow the same logic. For example, some LMR systems are owned by BIA but are maintained by the tribal nation. In some cases, this may be because of the tribal nation's transition from BIA-supported status to a self-supported condition.

Shown in Figure 7 is a graphical depiction of the breakdown of the ownership of the LMR systems used by the assessed tribal nations. The number of systems is shown in parentheses.

Figure 7: Ownership of LMR Systems in Use by Tribal Nations



The following findings regarding LMR infrastructure are for BIA-owned and tribal-owned systems. In general, LMR infrastructure included in this assessment is old and in poor condition. The main finding regarding LMR infrastructure is that it does not support the communications needs of public safety personnel. Many factors contribute to the inability of these LMR systems to support public safety operational needs; they include (in no particular order)—

- **The Majority of LMR Infrastructure Components are 20–25 Years Old**

With the exception of one tribal nation, equipment age varies from 15 to 30 years old with the average age being between 20–25 years old.

- **The LMR Infrastructure Lacks Regular Preventative Maintenance**

A very small percentage of LMR systems used by tribal nations receive any regular preventative maintenance. In almost all cases, the only time LMR technicians see the equipment is to perform repairs when the equipment has failed or is broken.

- **Transmitter Site Locations Lack Backup Power**

Without exception, there is no backup power equipment installed at transmitter sites. In the event of unexpected primary power failures, sites do not transmit until repair personnel respond to resolve the problem responsible for the power failure.

- **Transmitter Sites Lack Proper Grounding and Environmental Controls**

With few exceptions, transmitter sites are ill-equipped to handle extreme environmental conditions like extreme heat and cold, or lightning. Many sites lack any environmental controls such as heating and/or air conditioning and proper grounding. Sites are typically located on high ground, making them more susceptible to lightning, and in the case of areas of the southwest, certain elevations can be more vulnerable to cold temperatures in the winter and extreme heat in the summer.

- **The LMR Infrastructure Has Significant Down Time**

It is not unusual for some tribal nations' LMR systems to be out of service for several days at a time. This down time is affected by a lack of available parts for aging equipment, poor transmitter site conditions, and travel time to remote transmitter site locations.

- **The Private Sector Maintains the LMR Systems**

In most cases, LMR infrastructure maintenance is contracted out to private LMR vendors. These repair vendors are usually located in more populated areas, and therefore travel time to tribal lands and their remote transmitting sites can significantly delay repairs, especially if parts must be retrieved from the private vendor's business location.

- **Radio Coverage Is Poor**

By far the most common complaint from public safety providers interviewed was a lack of LMR coverage. LMR coverage prediction plots generated for each tribe indicate that, with few exceptions, only 50 percent of tribal land has available talk-in mobile coverage.¹ Portable radios fare much worse, with an average of less than 30 percent talk-in coverage. On average, less than 60 percent of tribal nations' land has talk-out coverage.²

¹ Refers to the ability of mobile radio users to successfully communicate into the transmitter

² Refers to the ability of a dispatcher, for example, to communicate from the transmitter with personnel in the field

- **Channel Congestion Is a Common Problem**

Another common concern expressed by interviewed personnel was the inability to access a dispatcher or other user because too many users were attempting to use the same channel. This is not a surprising finding because many of the tribal nations have multiple public safety agencies on one channel, or in some cases, are mixing non-public safety users (e.g., tourist operations) with public safety agencies. Approximately one-third of assessed tribal nations have non-public safety users using the same LMR system as public safety.

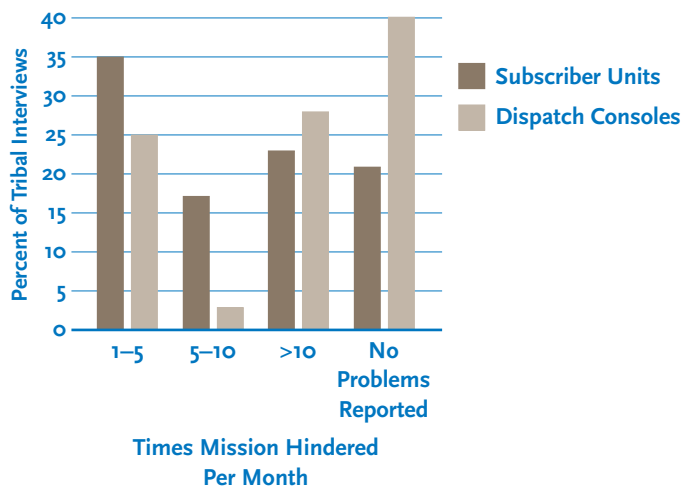
- **Dispatch Resources Are Inadequate**

Support from dispatchers was a concern for public safety users in the field. Field personnel did not feel that dispatchers were adequately trained, especially with regard to fire and rescue and EMS operations. Field personnel, as well as dispatchers themselves, felt that they had too many duties to properly support the demands of users in the field. Duties vary from one nation to another, but it is common for the same dispatch personnel to be required to support jail operations, answer emergency calls, and be responsible for dispatching equipment and personnel from several different agencies.

- **Equipment Problems Hinder Mission Performance**

An overwhelming number of comments and data were collected regarding how equipment problems hinder mission performance. Many of the comments regarding equipment problems related to coverage problems and channel access difficulties. Figure 8 shows how often equipment problems negatively affected public safety's work. Over 75 percent of all subscriber users experience at least one problem per month that hinders mission performance. Approximately 40 percent of subscriber users experience five or more problems per month. Over 50 percent of dispatch personnel interviewed experience at least one problem per month that negatively affects their ability to do their jobs.

Figure 8: Frequency of Equipment Problems That Hinder Mission Performance



4.2 LMR Subscriber Equipment

Unlike infrastructure equipment, which is, in many cases, more than 20 years old, most subscriber equipment is much newer. Detailed data was not provided on the age of subscriber equipment; however, many of the assessed tribal nations have equipment that varies in age from as new as 1 year to as old as 15 to 20 years.

Concerns regarding subscriber equipment were not extensive. In fact, only two themes appeared in the assessment—

- **Longer Battery Life Is Needed**

Personnel, regardless of mission and length of shift, overwhelmingly desired additional battery life for their portable radios. This is not a surprising finding given that the public safety community, in general, is always looking for ways to increase the longevity of batteries. However, the tribal nations are not using commonly accepted practices relative to battery management or the use of technology products (e.g., conditioners and optimizers) to increase the capacity and use of batteries.

- **Smaller Size and Weight Portable Radios Are Desired**

Public safety staff also indicated a desire for smaller size and weight portable radios. This is not an unexpected finding, given the conditions under which the majority of personnel work. In remote areas, personnel need to patrol and perform rescue duties on narrow trails, and areas with steep drop-offs. These public safety workers would benefit from smaller size and weight portable radios.

4.3 Commercial Services

Commercial services, such as cellular telephone and paging, are commonly used at the assessed tribal nations. Common themes from the data collected include—

- **Cellular Telephone and Paging Service Coverage Is Similar to LMR Coverage**

For some of the same reasons (e.g., terrain) that LMR coverage is poor, it also negatively affects the use of land-based commercial services. When personnel are unable to communicate using LMR, they attempt to use cellular telephones but are not always successful in establishing communications.

- **Satellite Commercial Service Use Is Not Common**

Despite the lack of LMR and cellular communication coverage for many of the remote areas that public safety personnel are patrolling, the use of satellite telephone or pagers is not widespread. Only 2 of the 12 tribes assessed use satellite telephones—1 is a public safety agency, and the other is a tourist operation.

4.4 Wireless Data

Although interviewees expressed a need and desire for the ability to use wireless data technology and their associated applications, few tribal nations use it. Three key findings regarding wireless data include—

- **Wireless Data Use Is Almost Non-Existent**

Only 1 of the 12 tribes assessed is using wireless data. The Lummi Nation obtained the required grant funding to implement wireless data access via a commercial service called cellular digital packet data. Personnel at the Lummi Police Department indicate that the technology significantly improves their operating efficiency and service to the members of the tribal nation and visitors to its lands.

- **Wireless Data Is Desired by All Law Enforcement**

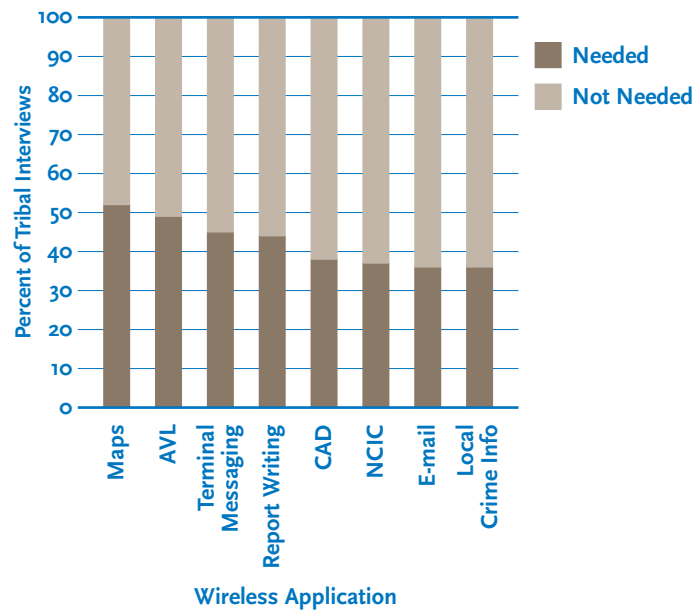
Only one tribe uses wireless data, but all law enforcement personnel interviewed were aware of the benefits of the technology and would like to use it in their daily duties. Law enforcement personnel want access to local and national criminal databases, as well as some advanced applications such as automatic vehicle location (AVL) and maps.

- **Fire and Rescue and EMS Personnel Have Limited Desire for Wireless Data**

For the most part, fire and rescue and EMS personnel saw limited benefits from their use of wireless data applications. However, fire and rescue and EMS personnel were interested in the advantages of integrating wireless data with computer-aided dispatch and applications such as AVL and maps.

Figure 9 depicts the wireless data desires for public safety providers interviewed.

Figure 9: Wireless Data Needs



4.5 Security

The PSWN Program assessed three areas related to security: facilities, maintenance, and voice communications. Key findings in these areas include—

- **Facilities Lack Physical Security**

There is a lack of security at tribal facilities including transmitter sites, administrative buildings, and dispatch locations. Specifics include—

- *Transmitter Sites*

The assessment teams observed a lack of locks and fences at transmitter sites. In some cases, there was no door or other structure to prohibit access to critical communications equipment. In addition, at the sites that had some limited security barriers, no alarm monitoring equipment was installed to alert personnel to unauthorized access. In one case, homeless people were using a transmitter site as a shelter.

- *Administrative Buildings*

Many of the administrative buildings were observed to have few guards on duty or locked doors to prevent unauthorized access. Also, portable radios located in chargers were common on staff desks, easily accessible by the public. This is of concern because portable radios could easily be taken from the facility and used to monitor and more importantly, tie up radio resources. Without a charger, portable radios have a limited life and use by unauthorized personnel. However, if unauthorized personnel were able to obtain a charger, they would have almost unlimited use of the radio and thereby, unlimited ability to negatively affect public safety operations.

- *Dispatch Locations*

In cases where dispatch operations were observed, security of these locations was also weak. Situations found included unlocked radio rooms, open doors, and easy access to dispatch consoles.

- **Voice Communications Lack Privacy**

Few topics generated as much comment and discussion as secure voice communications. Public safety personnel related countless stories of how commonplace it was for people to own scanners and monitor public safety radio traffic. The assessment teams were told of incidents in which people showed up to the scene of emergency incidents to “see what was going on,” and stories about people who monitor police radio traffic to elude capture or to determine the best location to commit illegal acts.

- **Law Enforcement Desire Secure Communications**

With scanner monitoring commonplace, someone from each tribal nation law enforcement agency indicated the desire for secure or encrypted communications to better perform his or her duties. Law enforcement personnel felt that their ability to do their job was compromised by illicit monitoring of radio communications.

4.6 Interoperability Requirements

The main focus of this assessment was to analyze the current state of interoperable communications between tribal nations and the agencies that support them. Figure 10 provides an overview of the success of interoperability initiatives by tribal nations. For the most part, tribal nations require interoperable communications with local agencies. There is limited need for interoperable communications with state and federal agencies.

One of the most common impediments to establishing interoperable communications is technology. In the case of many tribal nations, this challenge is most evident in agencies operating in different frequency bands.

Each tribal nation has unique challenges and circumstances affecting its ability to establish interoperable communications with tribal, local, state, and federal agencies. With that said, the following are some common findings regarding interoperability—

- **Many Tribal Nations and Local Agencies Operate in the Same Frequency Band**

For the most part, tribal nations and local agencies operate in the VHF band. This has the potential to simplify the establishment of interoperable communications between these agencies. However, many situations were identified where the tribal nation required interoperability with a local agency, operated in the same band, but had not contacted the local agency to discuss establishing communications interoperability.

- **Tribal Nations Have Achieved Limited Interoperable Communications With State Government Public Safety Providers**

Whereas, tribal and local agencies operate in the same band (e.g., VHF), most state governments for assessed tribal nations operate in the UHF band. This complicates linking public safety agencies from tribal nations and the state. In all cases, the requirement for interoperability is with law enforcement and helicopter medical evacuations. Fortunately, most helicopters are configured with dual-band radio capabilities, allowing helicopter personnel access to both UHF and VHF frequency bands.

- **Tribal Nations Have Achieved Limited Interoperable Communications With Federal Government Public Safety Providers**

Not unlike local agencies, many federal users also operate in the VHF frequency band. Some of the same technical issues apply to establishing interoperability with federal agencies as with local agencies. However, many federal law enforcement agencies (e.g., FBI and Drug Enforcement Administration) operate under strict rules governing the use of their radio systems, including a requirement to use encryption (e.g., voice privacy). Such requirements create difficulty in establishing agreements that allow tribal users access to federal systems. However, many tribal nations allow access to their LMR systems by FBI agents. In such cases, the FBI radio user programs the tribal nation's frequencies into his/her portable radio, enabling that user to talk directly with tribal users, as needed.

Figure 10: Interoperability Statistics

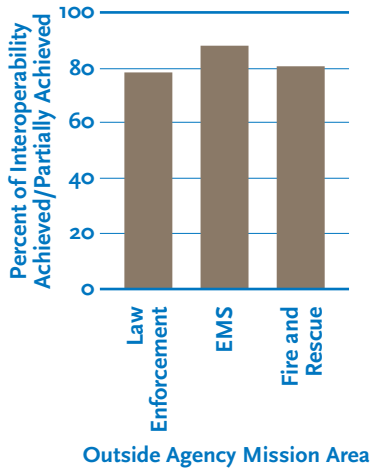
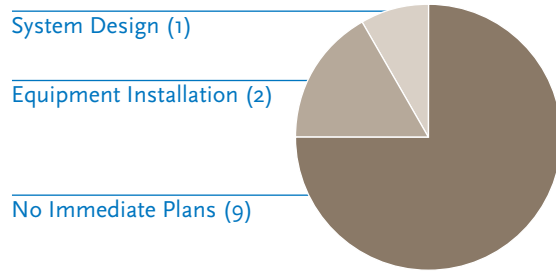


Figure 11: LMR Planning Status for Tribal Nations



4.7 Financial Considerations

Detailed cost and funding data was not available to the PSWN Program. However, two key themes were apparent—

- There Is a Lack of Dedicated Funding for Current or Future Communications Needs**
 While specific data on funding was not available, it was clear from data collected that there is no dedicated or budgeted funding for current communications needs. This translates into a lack of preventative maintenance and the use of equipment well beyond its useful life. In most cases, funding for communications is based only on immediate needs to address equipment failures.
- There Is Limited Planning Regarding Future System Replacement**
 Because no assessed tribal nation dedicates a full-time position to overseeing and planning for LMR communications needs, there is a lack of planning regarding system replacement. Tribal nations rely on either a private subcontractor and/or a public safety official assigned to oversee LMR issues to plan for their future system needs. The private sector has many accounts and customers and is rarely proactive in assisting a tribal nation with strategic planning regarding future needs. In many cases, the public safety official assigned LMR oversight duties already has a full-time assignment, and therefore, system planning is not a pressing need. The disconnect between system need and planning for system enhancement or replacement manifests itself in the proliferation of aging systems and no solidified plan to address the costly enhancement or replacement. Figure 11 provides an overview of the planning or implementation status for the assessed tribal nations.

Of the 12 tribal nations assessed, all 12 agreed that substantial system changes were required but only 3 were in the process of planning or implementing a new system. Of the three that were in the process of making changes, two are in the process of installing new systems and a third is in the system design phase to install a new system. All three of these tribes recognized that their existing equipment was beyond its useful life and replacement was required.

5. Conclusion

The tribal nations included in this public safety communications interoperability assessment are not necessarily representative of the more than 500 tribal nations located in the United States. However, the assessment was successful in assessing rural and urban nations, tribal nations with populations from 700 to more than 170,000, and nations with land masses varying from 123 acres to more than 17.5 million acres. In addition, the program assessed LMR systems that work under the demanding terrain conditions found on many tribal lands. The PSWN Program visited tribal nations that provide a variety of public safety services to their members and visitors and have a variety of tribal enterprise operations like casinos, hunting, and river expeditions that sometimes drive additional public safety demand and use of LMR communications systems.

The various conditions encountered by the PSWN Program provide for challenging public safety communications on tribal lands. Findings for the assessment track to the five key issue areas affecting interoperability—coordination and partnerships, funding, spectrum, standards and technology, and security.

Specifically, key findings for the assessment include—

- LMR systems do not fully support user requirements.
- LMR systems are operating beyond their useful life.
- Establishing interoperable communications requires that tribal nations coordinate with local, state, and federal agencies.
- There is a lack of funding regarding meeting current and future system needs.
- There is a lack of planning regarding system replacement efforts.

The findings of this assessment are not unlike those of the findings of the National Institute of Justice's Wireless Communications and Interoperability Among State and Local Enforcement Agencies report and the PSWN Program Fire and EMS Communications Interoperability Study. Tribal nations face many of the same problems other public safety agencies face across the United States.

Although many of the problems faced by tribal nations are similar to those of many public safety agencies in the United States, the PSWN Program provided each tribal nation with a recommendations report that specifically addresses that tribe's needs. The report provides the tribal nation with an assessment of its current LMR infrastructure, recommendations for correcting any LMR infrastructure deficits, as well as potential solutions to interoperability challenges.

Appendix—Acronyms

AVL	Automatic Vehicle Location
BIA	Bureau of Indian Affairs
EMS	Emergency Medical Services
FBI	Federal Bureau of Investigation
LMR	Land Mobile Radio
NP	National Park
PSWN	Public Safety Wireless Network
UHF	Ultra High Frequency
VHF	Very High Frequency



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