



*Public Safety WINS, Version 2  
Policy Solutions—Spectrum*

**FINAL**

**July 2002**

## Policy Solutions Introduction

The recent acts of domestic terrorism have elevated and highlighted the importance of public safety wireless interoperability. As such, seamless interoperable communications between public safety related agencies, across all levels of government, has become a top priority. Seamless interoperability can be achieved only when stakeholders work together to address the key policy issue areas identified by the Public Safety Wireless Network (PSWN) Program. The PSWN Program has worked to understand the importance of each policy issue and has identified actions and approaches to meet current and future interoperability challenges. Our solutions offer insight, guidance, and resources for stakeholders in their efforts to improve interoperability. This section also provides a detailed review of the impact of each issue on interoperability and what constitutes success in addressing the issue.

## Spectrum—Relevance to Interoperability

Radio spectrum is the basis for all public safety wireless systems in use today. Spectrum is the array of channels, similar to channels on a television, that are available for communications transmissions. Because it is a finite resource that cannot be created or discovered, usable spectrum is scarce and public safety agencies are faced with intense competition with commercial wireless providers that are willing to pay the Federal Government large sums of money for spectrum access.

Because of congestion and interference in many parts of the country, particularly in metropolitan areas, public safety agencies need to use their existing available channels to satisfy day-to-day operations. Although the Federal Communications Commission (FCC) recently has allocated 2.6 Megahertz (MHz) of interoperability spectrum in the new 700 MHz frequency band, it will likely not be available until at least 2006. Similarly, although an additional 50 MHz of broadband spectrum was allotted to public safety agencies, effective allocation of spectrum is still required as public safety agencies upgrade technology and add wireless data and video capabilities.

Spectrum allocated to public safety makes communicating across agencies extremely difficult. Local, state, and federal public safety agencies currently use eight discrete frequency bands ranging from 30 MHz to above 800 MHz. No single, commercial grade radio is capable of operating in all the bands used by different agencies.

Overall, effective spectrum management can significantly improve the potential to achieve widespread interoperability. The FCC develops spectrum management rules and regulations for state and local public safety agencies through its Wireless Telecommunications Bureau. The National Telecommunications and Information Administration (NTIA) develops the spectrum management rules and regulations for federal public safety agencies. Unfortunately, these independent spectrum management processes make it difficult to achieve true local, state, and federal interoperability.

Success in the area of spectrum will manifest as advancement to a higher level of interoperable public safety communication systems. The following matrix illustrates the common stages that public safety agencies may exhibit as they progress towards that desired end state—

New	Developing	Established	Mature
<ul style="list-style-type: none"> <li>• Determining efficiency and appropriateness of frequency bands</li> <li>• Researching spectrum constraints and identifying ways to maximize available frequencies</li> <li>• Developing a strategy to move public safety to newly allocated spectrum</li> <li>• Researching spectrum management processes</li> </ul>	<ul style="list-style-type: none"> <li>• Establishing spectrum sharing arrangements</li> <li>• Initiating plans for the use of the interoperability frequencies</li> <li>• Obtaining necessary spectrum</li> <li>• Understanding processes that encourage interoperability</li> <li>• Initiating spectrum management processes</li> </ul>	<ul style="list-style-type: none"> <li>• Formalizing frequency sharing arrangements</li> <li>• Promoting mutual-aid channels and shared infrastructures across numerous levels of government</li> <li>• Implementing plans for use of the interoperable frequencies</li> <li>• Formalizing plans for migration to the newly allocated spectrum</li> <li>• Continuing to implement spectrum management processes</li> </ul>	<ul style="list-style-type: none"> <li>• Expanding spectrum arrangements across all levels of government</li> <li>• Participating in shared infrastructures to efficiently use available spectrum</li> <li>• Expanding plans for use of the interoperable frequencies</li> <li>• Implementing plans for migration to the newly allocated spectrum</li> <li>• Expanding spectrum management processes to include public safety agencies across all levels of government</li> </ul>

## Target Audiences Introduction

The PSWN Program understands that it cannot resolve the five policy challenges alone and that many people must assume the responsibility to achieve success in each policy area. These five challenges must be addressed by local, state, federal, and tribal public safety entities and the broader set of public safety communications stakeholders, including the U.S. Congress, regulatory agencies, civic leadership forums, and equipment manufacturers. These key public safety entities and stakeholders are jointly responsible for the resolution of interoperability issues. This section is designed to allow members of each group to identify specific actions they can take related to each issue area that can ultimately lead to the successful development of an interoperability solution.

## Relevance to State Decision Makers

State decision makers must recognize the importance of spectrum to the efficient use of their wireless communications systems. Even with the recent allocation of 50 megahertz (MHz) of broadband spectrum, public safety agencies continue to be in need of adequate spectrum to do their job. Homeland Defense initiatives have further heightened the need for local, state, federal, and tribal agencies to improve and share their wireless communications systems to prepare for emergency situations. The lack of interoperability spectrum resources can severely hinder the ability of public safety personnel to respond to day-to-day activities and large-scale incidents (e.g., September 11<sup>th</sup> and natural disasters).

In the next few years, public safety agencies will be looking to develop new wireless systems in the 700 MHz frequency band. This band, which will include 24 MHz of open spectrum for use by the states, will offer many benefits to public safety agencies, namely greater ease of coordinating mission critical response across all levels of government. Unfortunately, public safety will be unable to use the band until all television stations in each jurisdiction that currently use channels 60–69 transition to digital television (DTV) technology.

Public safety agencies will need significant funding to transition their systems to the new frequency bands. Several states are looking at ways to share spectrum resources to improve both cost and resource efficiencies in systems development. However, current rules make sharing with federal agencies extremely difficult.

## Actions/Solution Steps for State Decision Makers

State decision makers can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can work to understand the spectrum requirements and challenges facing today's public safety agencies. State decision makers can also learn, at a high level, about the complex processes of the Federal Communications Commission (FCC) that address spectrum management.

The following resources will prove useful to state decision makers in understanding public safety's spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *PSWN Radio Spectrum Policy & Legislative Issues Report*
- *State and Local Spectrum Management Processes Report*
- *The Role of the States in Public Safety Wireless Interoperability*

By understanding the relevance that ongoing dockets at the FCC have to public safety, state decision makers can effectively participate in rulemaking processes that affect the policies and rules being developed for new public safety spectrum. As a reference tool, state decision makers can use the Public Safety Wireless Network (PSWN) Program's positions on spectrum matters.

State decision makers can also encourage spectrum policy changes (e.g., allowing co-equal access for federal and state/local interoperability spectrum) that would promote the use of shared radio systems between state and federal public safety agencies.

The following resources will prove useful to state decision makers participating in the rulemaking process—

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *PSWN Program Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, ET Docket 00-47, ET Docket 98-153, and WT Docket 00-19*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

State decision makers can provide state-level leadership to advance public safety spectrum issues. They can also support the development of, and participate in, a State Interoperability Executive Committee (SIEC) to manage new public safety spectrum within the state. State decision makers can also appoint a spectrum manager to operate new public safety spectrum within states, initiate comments to the FCC, develop wireless communication interoperability through the regional planning committees (RPC) of each state, and serve as a liaison to assist in federal to state coordination efforts. State decision makers can also fund statewide systems and development efforts that share spectrum, either between state and local entities or between state and federal entities.

The following resources will prove useful to a state decision maker during the development of an SIEC—

- *PSWN Program White Paper Regarding State Interoperability Executive Committees*
- *State Interoperability Executive Committees: States' Most Effective Tool for Coordinating Interoperability*

State decision makers can also specifically define public safety requirements for land mobile radio equipment manufacturers. They can encourage equipment manufacturers to develop spectrally efficient, multiband radio technology. State decision makers can encourage vendors to develop infrastructure and radios for the new public safety bands.

## Relevance to Regional Decision Makers

Regional decision makers must recognize the importance of spectrum to the efficient use of their region's wireless communications systems. Even with the recent allocation of 50 megahertz (MHz) of broadband spectrum, public safety agencies continue to be in need of adequate spectrum to do their job. Homeland Defense initiatives have further heightened the need for local, state, federal, and tribal agencies to improve and share their wireless communications systems to prepare for emergency situations. The lack of interoperability spectrum resources can severely hinder the ability of public safety personnel to respond to day-to-day activities and large scale incidents (e.g., September 11<sup>th</sup> and natural disasters).

In the next few years, public safety agencies will be looking to develop new wireless systems in the 700 MHz frequency band. This band, which will include 24 MHz of open spectrum for use by the states, will offer many benefits to public safety agencies, namely greater ease of coordinating mission critical response across all levels of government. Unfortunately, public safety will be unable to use the band until all television stations in each region that currently use channels 60–69 transition to digital television (DTV) technology.

Public safety agencies will need significant funding to transition their systems to the new frequency bands. Several states are looking at ways to share spectrum resources to improve both cost and resource efficiencies in systems development. However, current rules make sharing with federal agencies extremely difficult.

## Actions/Solution Steps for Regional Decision Makers

Regional decision makers can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can work to understand, at a high level, spectrum requirements and challenges for today's public safety agencies. Regional decision makers can also learn about the complex processes of the Federal Communications Commission (FCC) that address spectrum management.

The following resources will prove useful to regional decision makers with understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *PSWN Radio Spectrum Policy & Legislative Issues Report*
- *State and Local Spectrum Management Processes Report*

By understanding the relevance of ongoing dockets at the FCC, regional decision makers can effectively participate in rulemaking processes that affect the policies and rules being developed for new public safety spectrum. As a reference tool, regional decision makers can use the Public Safety Wireless Network (PSWN) Program's positions on spectrum matters. They can also use

these tools to encourage spectrum policy changes (e.g., allowing co-equal access for federal and state/local interoperability spectrum) that would promote the use of shared radio systems.

The following resources will prove useful to regional decision makers participating in the rulemaking process—

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *PSWN Program Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, ET Docket 00-47, ET Docket 98-153, and WT Docket 00-19*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

Regional decision makers can provide leadership to advance public safety spectrum issues. They can also support the development of, and participate in, regional planning committees (RPC) and State Interoperability Executive Committees (SIEC) to manage new and existing public safety spectrum within the region.

The following resources will prove useful to regional decision makers participating in an SIEC—

- *PSWN Program White Paper Regarding State Interoperability Executive Committees*
- *State Interoperability Executive Committees: States' Most Effective Tool for Coordinating Interoperability*

Regional decision makers can also specifically define public safety requirements for land mobile radio equipment manufacturers. They can encourage equipment manufacturers to develop spectrally efficient, multiband radio technology. Regional decision makers can encourage vendors to develop infrastructure and radios for the public safety bands.

## Relevance to Public Safety Community

The public safety community must recognize the importance of spectrum to the efficient use of their wireless communications systems. Public safety agencies need adequate spectrum to do their job. However, public safety agencies have little or no remaining spectrum to use and therefore cannot make any significant system enhancements. With additional spectrum, the public safety community could add additional voice, data, and video capabilities that would better protect the lives and property of citizens within their jurisdictions. Without sufficient interoperable spectrum, public safety agencies will be unable to talk to one another when responding to emergencies. Similarly, when wireless systems experience interference, loss of coverage, and congestion, the lives of citizens as well as public safety personnel are put at significant risk.

In the next few years, new spectrum will be available for the development of wireless systems in the 700 megahertz (MHz) frequency band. This new band will include 24 MHz of open spectrum for use by the states. Unfortunately, the public safety community will be unable to use the band until all television stations that currently use channels 60–69 in the jurisdiction transition to digital television (DTV) technology. Similarly, although 50 MHz of broadband spectrum has been allocated to public safety agencies, additional spectrum is needed to enhance voice, data, and video capabilities that would better protect lives and property. It is critical that public safety officials at all levels provide information to spectrum managers concerning user needs and requirements that local, state, and federal public safety agencies have.

## Action/Solution Steps for the Public Safety Community

The public safety community can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. These spectrum allocation processes are often cumbersome and confusing. The public safety community must obtain a general understanding of public safety's spectrum needs. By becoming knowledgeable in the spectrum requirements and complex processes involved in spectrum management, the public safety community can better understand the processes that local, state, and federal public safety agencies must follow to obtain spectrum for their wireless communications systems.

The following resources will prove useful to the public safety community in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *PSWN Radio Spectrum Policy & Legislative Issues Report*
- *State and Local Spectrum Management Processes Report*
- *Federal Spectrum Management Processes Report*

The public safety community can also develop a long-term spectrum plan to migrate the wireless communications systems to new public safety bands as they become available. This plan could

work to consolidate the wireless operations to a minimum number of spectrum bands and coordinate with federal public safety agency efforts. The public safety community can use the Public Safety Wireless Network (PSWN) Program's positions as a reference for spectrum matters. These positions can also be used to encourage spectrum policy changes (e.g., allowing co-equal access for federal and state/local interoperability spectrum) that would promote the use of shared radio systems.

The following resources will prove useful to the public safety community in participating in the spectrum rulemaking process —

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *PSWN Program Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, ET Docket 00-47, ET Docket 98-153, and WT Docket 00-19*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

The public safety community can participate in the National Coordination Committee (NCC), the FCC-sponsored organization responsible for developing rules for the interoperability spectrum in the new 700 megahertz (MHz) band. By participating in rulemakings that affect the policies and rules being developed for new public safety spectrum, the public safety community can understand the relevance that ongoing dockets at the FCC have to public safety.

The following resource will prove useful to the public safety community in understanding the functions of the NCC —

- *The NCC Homepage (<http://www.fcc.gov/wtb/publicsafety/ncc.html>)*

The public safety community can also work to define field-level requirements for land mobile radio equipment manufacturers. It can encourage equipment manufacturers to develop spectrally efficient, multiband radio technology while also encouraging vendors to develop infrastructure and radios for the public safety bands.

## Relevance to Civic Leadership Forums

Civic leadership forums create momentum around issues important to communities. Therefore, civic leadership forums must realize that the lack of interoperable communications can severely hinder the ability of public safety personnel to respond to day-to-day activities and large-scale incidents, (e.g., September 11th, natural disasters). The lack of interoperability spectrum resources is hindering effective public safety operations. Without sufficient interoperability spectrum, public safety agencies will not be able to talk to one another while they are using different systems. Similarly, when public safety wireless systems experience interference, loss of coverage, and congestion, the lives of citizens and of responding public safety officials are put at significant risk.

## Actions/Solution Steps for Civic Leadership Forums

Civic leadership forums can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can obtain a general understanding of public safety's spectrum needs. By understanding and becoming knowledgeable in the spectrum requirements for today's public safety agencies, civic leadership forums can better identify the spectrum challenges facing public safety agencies.

The following resources will prove useful to civic leadership forums in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*

Civic leadership forums can also participate in rulemaking processes that affect the policies and rules being developed for new public safety spectrum. They can use the Public Safety Wireless Network (PSWN) Program's positions as a reference for their positions on spectrum matters. Civic leadership forums can also use these references to understand the relevance of ongoing Federal Communications Commission (FCC) dockets and to educate the U.S. Congress about the need to allocate more spectrum to public safety.

The following resources will prove useful to civic leadership forums participating in the rulemaking process—

- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *PSWN Program Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, ET Docket 00-47, ET Docket 98-153, and WT Docket 00-19*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

Civic leadership forums can participate in regional planning committees (RPC) that manage new and existing public safety spectrum in the region. They can urge public safety agencies to participate in state to federal, or regional to federal, shared systems. Civic leadership forums can also file comments with the FCC or attend National Communications Committee (NCC) meetings to understand and provide feedback about the processes.

The following resource will prove useful to civic leadership forums in understanding the functions of the NCC—

- *The NCC Homepage* (<http://www.fcc.gov/wtb/publicsafety/ncc.html>)

## Relevance to the U.S. Congress

The U.S. Congress must recognize the importance of spectrum and its effect on protecting citizens. Even with the recent allocation of 50 megahertz (MHz) of broadband spectrum, public safety agencies continue to be in need of adequate spectrum to do their job. The lack of interoperable communications can severely hinder the ability of public safety personnel to respond to day-to-day activities and large-scale incidents (e.g., September 11, natural disasters). Homeland Defense initiatives have further heightened the need for local, state, and federal agencies to improve and share their wireless communications systems to prepare for emergency situations.

The U.S. Congress is one of the chief influences on radio spectrum policy formulation and implementation. Its members have the authority to allocate spectrum for use by public safety (as well as commercial and research entities). The U.S. Congress also created the Federal Communications Commission (FCC) to implement the radio spectrum laws and provides oversight over its activities. Additionally, the Communications Subcommittee within the Commerce, Science, and Transportation Committee is the responsible Senate entity for legislation and regulation of spectrum issues and should be aware of public safety's needs. The Commerce Subcommittee on Telecommunications, Trade, and Consumer Protection within the Commerce Committee is the responsible House of Representatives entity for legislation and regulation of spectrum issues and also should be aware of public safety's needs.

In the Balanced Budget Act of 1997, the U.S. Congress allocated 24 megahertz (MHz) of spectrum to public safety. This allocation provides much needed spectrum to public safety but unfortunately, public safety will be unable to use the band until all television stations that currently use channels 60–69 transition to DTV technology.

## Actions/Solution Steps for the U.S. Congress

The U.S. Congress can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. Its members can recognize public safety's spectrum needs and identify the spectrum challenges facing public safety agencies within the jurisdictions they represent. Therefore, the U.S. Congress can better understand and become knowledgeable about the spectrum requirements for today's public safety agencies.

The following resources will prove useful to the U.S. Congress in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report* (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*
- *The Role of the Federal Government in Public Safety Wireless Interoperability*

The U.S. Congress can balance the growing need and urgency for use of new and future wireless voice, high-speed data, and Internet-accessible technologies with the public safety community's need to have sufficient spectrum in appropriate frequency bands. It can allot additional spectrum to public safety in, or adjacent to, bands currently used by public safety. It can also designate portions of new spectrum allocations for new public safety wireless technologies such as high-speed data and video applications. Additionally, the U.S. Congress can designate portions of new spectrum allocations for interoperability while also continuing to fund efforts that study and demonstrate the effective use of spectrum for the benefit of public safety.

## Relevance to the Federal Communications Commission (FCC)

Recently, the FCC allocated 50 megahertz (MHz) of broadband spectrum for public safety agencies. However, many agencies are still in need of adequate spectrum and do not have the resources to purchase additional spectrum while competing with commercial interests. Without sufficient interoperability spectrum, public safety agencies will be unable to talk to one another while they are using different systems. Similarly, when public safety wireless systems experience interference, loss of coverage, and congestion, the lives of U.S. citizens and responding public safety officials are at significant risk.

In the next few years, public safety agencies will be looking to develop new wireless systems in the 700 MHz frequency band. This band, which will include 24 MHz of open spectrum for use by the states, will offer many benefits to public safety agencies, namely greater ease of coordinating mission critical response across all levels of government. Unfortunately, public safety will be unable to use the band until all television stations in each jurisdiction that currently use channels 60–69 transition to digital television (DTV) technology. Additionally, public safety agencies will need significant funding to transition their systems to the new bands. Several states are looking at ways to share spectrum resources to improve both cost and resource efficiencies in systems development. However, current rules make sharing spectrum with federal agencies extremely difficult.

## Actions/Solution Steps for the Federal Communications Commission (FCC)

The FCC can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. It can recognize public safety's spectrum needs and identify the spectrum challenges facing public safety agencies throughout the Nation.

The following resources will prove useful to the FCC in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *The Role of the Federal Government in Public Safety Wireless Interoperability*

The FCC can also balance the growing need and urgency for use of new and future wireless voice, high-speed data, and Internet-accessible technologies with the public safety community's need to have sufficient spectrum in appropriate frequency bands. The FCC must exercise caution when auctioning large amounts of spectrum. The auction process can be resource and cost intensive, limiting public safety participation and therefore the amount of spectrum to which the public safety community has access. The FCC can also allocate additional spectrum to public safety in bands congruent to those currently used by public safety or in bands adjacent to those currently used by public safety to aid in communications interoperability.

The FCC can also designate portions of new spectrum allocations for new public safety wireless technologies such as high-speed data and video applications. It can also identify and designate

spectrum below 512 megahertz (MHz) for public safety interoperability. The FCC can take an approach to spectrum management that benefits public safety operations. It can develop, in coordination with public safety and industry, a spectrum migration strategy for public safety. This strategy should be progressive and accommodating of new technologies and strive to migrate public safety to a minimum number of frequency bands. Specifically, the FCC can protect the new 700 MHz public safety band from interference caused by television broadcasts on adjacent channels. The FCC can also support the development and rigorous evaluation of software-defined radios (SDR).

The following resource will prove useful to the FCC in understanding public safety spectrum needs with regards to specific frequency bands—

- *PSWN Program Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, ET Docket 00-47, ET Docket 98-153, and WT Docket 00-19*

The FCC can also work in cooperation with the National Telecommunications and Information Administration (NTIA) to develop and implement flexible rules that promote the use of spectrum for interoperability. It can allow co-equal access for federal and state/local interoperability spectrum to promote the use of shared radio systems.

The following resource will prove useful to the FCC in understanding the need for co-equal access—

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*

## Relevance to Equipment Manufacturers

Most public safety agencies have little or no remaining spectrum to use, and thus they cannot make any significant enhancements to their wireless systems. Spectrum and efficient communications equipment could allow public safety agencies to add voice, data, and video capabilities to better protect the lives and property of citizens across the Nation, especially as they prepare for Homeland Defense emergency plans.

Recently, the Federal Communications Commission (FCC) allocated 50 megahertz (MHz) of broadband spectrum to public safety agencies. This spectrum and the additional 24 MHz of spectrum in the 700 MHz band represents a significant new market opportunity for equipment manufacturers. Additionally, Federal Government users are required to use spectrally efficient equipment because of the federal narrowbanding requirements that must be met by 2005. Overall, equipment vendors face significant market opportunities as they make and sell new equipment to the public safety community.

## Actions/Solution Steps for Equipment Manufacturers

Equipment manufacturers can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They must understand the spectrum needs of local, state, and federal public safety users. Equipment manufacturers can then identify the spectrum challenges facing public safety agencies around the Nation and become knowledgeable about the spectrum requirements for today's public safety agencies.

The following resources will prove useful to the equipment manufacturers in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*

Equipment manufacturers can also develop technically advanced equipment for public safety. They can develop cost-effective, spectrally efficient, multiband radio technology and infrastructure for the new public safety bands. Additionally, equipment manufacturers can conduct research and development on software-defined radios (SDR) for public safety use.

## Relevance to the Federal Law Enforcement Wireless Users Group (FLEWUG)

The FLEWUG must recognize the importance of spectrum and its effect on federal wireless communications systems. Federal public safety agencies need adequate spectrum to effectively perform their job. However, FLEWUG-related agencies or departments have little or no remaining spectrum to use, and therefore cannot make any significant system enhancements. With additional spectrum, federal public safety agencies can add voice, data, and video capabilities that would better protect the lives and property of citizens. Similarly, when wireless systems experience interference, loss of coverage, and congestion, the lives of citizens and responding public safety agencies are at significant risk.

FLEWUG officials perform spectrum management functions for federal public safety agencies. This role is particularly important because federal departments must implement narrowband communications systems by 2005.

## Actions/Solution Steps for the Federal Law Enforcement Wireless Users Group (FLEWUG)

The FLEWUG can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. The FLEWUG can influence equipment manufacturers to aid public safety agencies. It can work to define field-level requirements for land mobile radio equipment manufacturers. The FLEWUG can also encourage equipment manufacturers to develop spectrally efficient, multiband radio technology and encourage vendors to develop infrastructure and radios for the new public safety bands.

The following resources will prove useful to the FLEWUG in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *PSWN Radio Spectrum Policy & Legislative Issues Report*
- *Federal Spectrum Management Processes Report*
- *The Role of the Federal Government in Public Safety Wireless Interoperability*

The FLEWUG can also act as an advocate for the federal public safety community in all spectrum-related matters. By continuing to understand the relevance of dockets at the Federal Communication Commission (FCC), the FLEWUG can encourage spectrum policy changes (e.g., allowing co-equal access for local, state, and federal interoperability spectrum) to promote the use of shared radio systems.

The following resources will prove useful to the FLEWUG in participating in the rulemaking process—

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *FLEWUG Comments/Reply Comments/Ex Parte Briefings to WT Docket 96-86, WT Docket 99-168, WT 00-32, and ET 00-47*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*
- The FLEWUG can educate fellow public safety agency members. Its members can educate others within the department or agency about complex spectrum issues and raise awareness of spectrum issues among senior decision makers. The FLEWUG can also use Public Safety Wireless Network (PSWN) Program how-to guides to show others how to successfully navigate through the federal spectrum management process.

The FLEWUG can also continue to support numerous groups that are addressing spectrum issues. It can support an inter-agency working group to advise the FLEWUG on spectrum-related matters. The FLEWUG can participate in the National Coordination Committee (NCC), the FCC-sponsored organization responsible for developing rules for the interoperability spectrum in the new 700 MHz band. Its members can also maintain seats on the steering committee and/or chairmanships of strategic subcommittees and working groups (i.e., interoperability, technology, and implementation) within the NCC to better serve the interests of the federal public safety community.

The following resource will prove useful to the FLEWUG in understanding the functions of the NCC

- *The NCC Homepage (<http://www.fcc.gov/wtb/publicsafety/ncc.html>)*

## Relevance to Federal Decision Makers

Federal decision makers must recognize the importance of spectrum and its effect on federal wireless communications systems. Even with the recent allocation of 50 megahertz (MHz) of broadband spectrum, public safety agencies continue to be in need of adequate spectrum to do their job. The lack of interoperable communications can severely hinder the ability of public safety personnel to respond to day-to-day activities and large-scale incidents (e.g., September 11, natural disasters). Homeland Defense initiatives have further heightened the need for local, state, and federal agencies to improve and share their wireless communications systems to prepare for emergency situations. Federal agencies assume an additional burden in providing effective Homeland Defense emergency plans and meeting complying with regulations such as the implementation of federal narrowband communications systems by 2005.

## Actions/Solution Steps for Federal Decision Makers

Federal decision makers can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can work to understand the spectrum requirements and challenges for public safety agencies across the Nation. They can also provide federal-level leadership to advance public safety spectrum issues and continue to fund programs that address public safety.

The following resources will prove useful to federal decision makers in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *The Role of the Federal Government in Public Safety Wireless Interoperability*

Federal decision makers can also influence other decision makers. They can educate the U.S. Congress and other federal decision makers about the need for adequate and appropriate public safety spectrum. They can also encourage the Federal Communications Commission (FCC) to make rules and regulations that make it easier for public safety agencies to develop wireless systems that allow them to effectively meet their mission. Federal decision makers can also encourage the National Telecommunications and Information Administration (NTIA) to find ways to encourage shared wireless resources between federal and state/local public safety agencies.

The following resources will prove useful to federal decision makers in understanding spectrum sharing and the rulemaking process—

- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

## Relevance to the National Telecommunications and Information Administration (NTIA)

The NTIA, under the U.S. Department of Commerce, is the telecommunications spokesman for the Executive branch of the Federal Government that regulates federal public safety spectrum. NTIA roles include the management of federal radio spectrum use, administration and management of telecommunications grants, and the research of telecommunications issues. The NTIA also has the responsibility to work with the Federal Communications Commission (FCC) to ensure sufficiently flexible rules exist for spectrum and other resource sharing between federal and state/local public safety agencies. The NTIA's Office of Spectrum Management plays a critical role in these public safety spectrum issues. This office created and now updates the *NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management*, which provides complete guidance for federal spectrum issues.

Two additional groups work with the NTIA to address spectrum-related issues. The Interdepartmental Radio Advisory Committee (IRAC) is a committee of federal radio managers that advises the President on the Federal Government's use of spectrum. The IRAC also develops and executes policies and procedures, and resolves disputes pertaining to the allocation, management, and use of federal spectrum. To aid in decision making, the Institute for Telecommunications Sciences (ITS) performs research on a variety of spectrum-related issues (e.g., interference in the 800 megahertz [MHz] band).

However, current rules make sharing of spectrum resources with the Federal Government extremely difficult. To aid in providing spectrum for public safety agencies, the NTIA must recognize the importance of spectrum and its effect on federal wireless communications systems. Even with the recent allocation of 50 megahertz (MHz) of broadband spectrum, public safety agencies continue to be in need of adequate spectrum to do their job. Similarly, when public safety wireless systems experience interference, loss of coverage, and congestion, the lives of U.S. citizens and responding public safety officials are at significant risk

## Actions/Solution Steps for the National Telecommunications and Information Administration (NTIA)

The NTIA can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can recognize public safety's spectrum needs and identify the spectrum challenges facing federal public safety agencies. The NTIA can continue to work in cooperation with the Federal Communications Commission (FCC) to develop and implement rules that promote the use of spectrum for interoperability while allowing co-equal access for local, state, and federal interoperability spectrum sharing.

The following resources will prove useful to the NTIA in understanding public safety spectrum needs—

- *Public Safety and Radio Spectrum Guide*
- *Spectrum Issues and Analysis Report*
- *Public Safety Radio Frequency Spectrum: Highlighting Current and Future Needs*
- *The Role of the Federal Government in Public Safety Wireless Interoperability*
- *The PSWAC Final Report (<http://pswac.ntia.doc.gov/pubsafe/final.htm>)*
- *Federal Co-Equal Access: Enabling Local, State, and Federal Partnerships (FLEWUG Position Paper)*
- *Petition for Rule Making by the Public Safety Wireless Network to Promote Allocation of Spectrum for Public Safety Agencies and Other Matters to Address Communications Needs Through 2010*

The NTIA can also balance the growing need and urgency for use of new wireless voice, high-speed data, and Internet-accessible technologies with the federal public safety community's need to have sufficient spectrum in appropriate frequency bands. They can identify additional federal spectrum that could be transferred for public safety's use in bands currently used by public safety or in bands adjacent to those currently used by public safety. Specifically, the NTIA can identify and transfer spectrum below 512 MHz for use for public safety interoperability and designate portions of new spectrum allocations for interoperability.

## Relevance to the Public Safety Wireless Network (PSWN) Program

The PSWN Program has identified, promoted, and is now working toward developing solutions to several key spectrum-related issues. These issues include increasing the amount and appropriateness of public safety spectrum while advocating public safety migration into a minimum number of frequency bands. The program is also working to identify coordination and sharing initiatives of spectrum dedicated for interoperability. Addressing spectrum issues will aid local, state, and federal public safety agencies in emergency situations and allow for a better understanding of the complex and burdensome spectrum management processes.

The PSWN Program is also involved in several discrete activities to help resolve public safety spectrum issues. They develop how-to guides that describe local, state, and federal spectrum management processes. The PSWN Program also participates (with the Federal Law Enforcement Wireless Users Group [FLEWUG]) in rulemaking and policy development activities at the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). The program also monitors ongoing spectrum issues and provides detailed studies and analyses that help the public safety community better understand the spectrum issues affecting them.

## Actions/Solution Steps for the Public Safety Wireless Network (PSWN) Program

The PSWN Program can take the following steps to ensure adequate spectrum is available and effectively used to meet interoperability requirements. They can continue the process of educating decision makers and the public safety community on the importance of spectrum and its relationship to improved interoperability. The program can continue to keep the public safety community informed of recent events in the spectrum arena and attempt to spur action on the spectrum issue with the U.S. Congress. The PSWN Program can also continue to develop how-to guides that help public safety agencies navigate complex spectrum management processes.

The PSWN Program can continue to participate in the National Coordination Committee (NCC), the Federal Communications Commission (FCC) sponsored organization responsible for developing rules for the interoperability spectrum in the new 700 megahertz (MHz) band. They can also obtain a seat on the steering committee and work to obtain chairmanships of key subcommittees and working groups (i.e., interoperability, technology, and implementation) within the NCC.

The PSWN Program can continue to participate in rulemakings that affect the policies and rules being developed for public safety spectrum. By acting as a voice for the public safety community in all spectrum-related matters, the PSWN Program can encourage the FCC to increase the amount of general use and interoperability spectrum available to public safety. They can also encourage spectrum policy changes (e.g., allowing co-equal access for local, state, and federal interoperability spectrum) that would promote the use of shared radio systems.

The PSWN Program can influence equipment manufacturers to aid public safety agencies. They can also work to define field-level requirements for land mobile radio equipment manufacturers. They can encourage equipment manufacturers to develop spectrally efficient, multiband radio technology and develop infrastructure and radios for the new public safety bands. The PSWN Program can also perform studies and analyses on timely spectrum issues. They can support analyses on interference

issues in the 800 MHz and 700 MHz frequency bands. Specifically, the PSWN Program can provide recommendations from the Public Safety Wireless Advisory Committee (PSWAC) report in addition to continuing support of pilot and interoperability assistance projects that demonstrate the efficient use of spectrum for interoperability.