APCO REPORTS

June 1996

Position Statements Regarding The Public Safety Wireless Advisory Committee (PSWAC) Subcommittee Reports

The Public Safety Wireless Advisory Committee (PSWAC) will undoubtedly be the single most important process in the public safety communications arena for years to come. During this process, the manufacturers and the federal government will be on hand to express their opinions and fulfill their agendas. APCO's recent efforts to become involved in the PSWAC proceedings prompted us to form a special task force to carefully examine the process as well as provide input. Our goal is to provide that input in a common voice, representing the thousands of public safety communications professionals APCO serves. This task force represents the users of the spectrum that PSWAC will seek. We are the professionals charged with providing quality communications for the protection of life and property - the end users. It is us who will benefit or suffer the actions of the FCC and NTIA in their final opinion in this process; therefore, it is paramount that we not let the voice of the users be silent.

Marilyn Ward,
APCO President-Elect

Executive Summary

APCO International appreciates the FCC/NTIA effort to establish PSWAC. This is sorely needed as, at a time when huge blocks of spectrum are being given or auctioned to PCS, SMRS, cellular telephone, satellite, and HDTV, public safety is being asked to improve spectrum efficiency, make greater use of commercial services, and restructure its assignment process. APCO International has created a special task force to work with PSWAC on behalf of its over 12,000 public safety communications members. This group has been active at every meeting and on each subcommittee. This is a brief summary of APCO's position. Our emphasis and goal throughout the PSWAC proceedings is to ensure this is a user driven process resulting in user defined solutions. APCO's membership represents every facet of public safety communications and faces the effects of the shortages in vital spectrum needed for the protection of life and property on a daily basis.

This document represents APCO's position on matters contained in the subcommittees' reports. However, at the time of this production, there were several reports in the draft phase. We believe it is important to render our opinion at this time before drafting of the final report from the PSWAC Steering Committee begins. Critical elements such as the need for spectrum in the 1710-1755 MHz band for data (primarily the Nationwide Law Enforcement and Public Safety Network proposed in the National Performance Review) and other long haul point-to-point microwave systems displaced by 2 GHz have been considered but due to timing and information available, were not included in this report. APCO will submit further comments in the future.

Large amounts of additional spectrum are urgently needed, both immediate and future. Commercial services can, and do provide a useful adjunct to public safety requirements, but cannot be used as a wholesale replacement for private systems.

Management of the spectrum allocated for public safety use can best be handled by direct representation from public safety on a non-profit, non-competitive basis. In conclusion, the priorities guaranteed to public safety for protection of life and property must not be jeopardized by placing a commercial or financial value on our precious and finite spectrum resource.

Operational Requirements

APCO supports the adopted definitions of public safety, public service and other terms found within the Interoperability Subcommittee Report. The basic mission of the Operational Requirements Subcommittee is to address the requirements of public safety agencies. The inclusion of other users should be limited to interoperability requirements between public safety and public service during the times they are performing joint operational tasks.

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Transport mechanisms, for exchange of information and control and support of infrastructure, are an essential part of public safety communications. Some entities use private agency-owned transmission facilities; i.e., microwave, fiber optics and fixed operational links lower in frequency than microwave. Others use commercially leased services for similar functions. There is no single type that is best under all circumstances. Public safety will require access to multiple forms of transport mechanisms in the future, including all the above listed options. Due to the emergency nature and special requirements of public safety, there are many instances where private infrastructure must be used in lieu of commercial services.

Wireless infrastructure to support data requirements will grow significantly in the future. The requirement for high security and high reliability is essential within public safety. New systems, such as NCIC 2000, will transmit criminal intelligence information over the airways and by law must be secure. Telemetry used by emergency medical responders must have the highest quality signals or erroneous data could be received. There has been a significant increase in the use of simulcasting. This technique poses significant challenges within the wireless data infrastructure. The recently funded Public Safety Wireless Network initiative offers a state of the art approach to addressing these needs for the entire public safety community.

Though the use of video by public safety agencies is just emerging, the requirement for spectrum to support this over the air is increasing. Video is being used in many highly dangerous situations, such as undercover drug buys, explosive ordinance disposal, major fire scenes and even traffic stops. Transportation departments are also using video as part of traffic management.

Public safety has historically made significant use of voice communications in both simplex and duplex modes. The demand for voice communications will not decrease, but rather continue to increase. In the past two years thousands of additional local law enforcement officers have been funded by the Violent Crime Control and Law Enforcement Act of 1994. This otherwise beneficial act and its resultant community policing illustrate the need for additional spectrum and infrastructure to support portable coverage.

Criminal justice agencies utilize all of the forms of communications discussed above. Law enforcement needs will greatly increase with the implementation of NCIC 2000. Correctional requirements are increasing across the country. Each new addition, such as alternative methods to incarceration, carries with it the demand for spectrum.

Fire and Emergency Medical Services also utilize every mode of communications. New and additional responsibilities are being assigned to both services. For example, fire departments are expanding services to include hazardous materials containment.

Emergency management at the federal, state and local levels has experienced increased demands for service in the past few years with hurricanes on the east coast, earthquakes on the west coast and floods and bombing in the heartland. Every part of the nation has experienced the need for help from the outside to recover from disasters. One common problem in each case has been the lack of sufficient frequencies to protect life and property. Dedicated channels are required to permit interoperability between all agencies in these critical incidents.

Secure communications are required in many public safety responses due to the content of the information. This is true not only in dealing with the criminal element, but in sensitive governmental operations as well. Fire and EMS workers do not want to release names of victims over the air. Privacy laws also restrict the release of certain information that needs to be carried on public safety channels.

The term public safety also includes a number of general governmental functions performed by federal, state, county and city agencies. This consists of many varied tasks. Whether it is for environmental control, highway maintenance or governmental mass transit, the use of wireless communications to perform these duties which serve taxpayers is growing. Demands upon all levels of government are increasing each year and, as a result, using radios has become a key to delivery of service. With continual budget constraints, "Working Smarter" has become a necessity, not an option.

Interoperability

Historically, public safety wireless started with the police service. It was not long before other public safety services recognized the value of this new mode of communications and developed systems accordingly.

The first need for interoperability became apparent when law enforcement agencies from various jurisdictions attempted to respond to mutual aid requests. As other services developed radio systems, it became obvious that interoperability could add immeasurably to the effectiveness of on scene operations.

Day to day coordination may take place within different agencies of the same discipline (federal, state, local law enforcement agencies) or among different disciplines with shared jurisdiction; i.e., local police, fire, and EMS agencies. Interoperability continues to play a critical role in mutual aid responses to significant events, such as wild land fires and civil disturbances, which often involve many agencies from a large geographic area with little or no time for prior planning. Lastly, the establishment of joint government task forces is becoming extremely popular for long term programs involving multiple layers of government to combat specific problems, e.g., narcotic trafficking. The recent trend in the public safety services is to have the closest available unit respond to an incident, regardless of jurisdiction. This breaking down of political boundaries has proven to be very beneficial in reducing response times. Interoperability has been crucial to the success of these shared responses. Helicopters, marine units and other specialized equipment are commonly shared by several agencies. Each of these arrangements requires a common mode of communication. In any type of major disaster or large scale event this requirement is dramatically increased.

Currently many law enforcement agencies share a single frequency for inter-agency communications; the same is

true for fire and medical services agencies. This proves woefully inadequate for day to day interoperability needs, much less large operations. Even the NPSPAC Plan which created a national calling frequency and four tactical frequencies is inadequate as it limits interoperability to those who use 800 MHz systems.

Another problem with common channels today is the lack of security. This inhibits the use of these channels for transmission of any type of sensitive information. As future interoperability is developed it must provide adequate security, both through encryption and licensing restrictions.

It is imperative that new blocks of spectrum allocated to public safety contain dedicated channels for interoperability. If more than one block is assigned, there must be interoperability frequencies in each block. New spectrum offers the greatest opportunity to develop channels for multiple agency operations. In any such interoperability allocation, we must minimize assignment by specific service (e.g., police) in favor of a public safety designation. This will allow use of interoperability channels according to the incident need without regard to service during a mutual aid response. For example, multiple police channels should not be left idle during a fire emergency. Interoperability channels should have uniform designations nationwide.

It should be apparent that the base line method of inter-communications is simplex, on scene contact. This allows all personnel with the common channel in their radio to communicate. Today there are usually low powered hand held units or mobile units operating in a single band. Tomorrow, the promise of multiple band radios offers the potential for greatly improved operations. As the range of such units is limited they are ideal for on scene incidents and the channels may be reused many times with geographical separation. However, this limited range can also be a disadvantage. As units from outside areas respond to mutual aid situations, they find themselves with no common communication channels until almost at the scene. This problem must be addressed by additional channels designed for common long range communications.

COMMERCIAL SERVICES

Interoperability is too important to attempt to use commercial providers. No commercial provider will offer the level of reliability, priority access, security and coverage that public safety agencies demand. Commercial providers will have little incentive to cover areas as thoroughly as public safety. In addition, commercial services, including both cellular and SMR systems, often become instantly blocked during an emergency. This blockage negates priority access measures. In addition, priority access often is a pre-event defined category. Priority access for personnel from a wider area will be difficult or impossible to provide.

▶ Technology

PUBLIC SAFETY COMMUNICATIONS APPLICATIONS

Reliability is important as is the need to interoperate. Because of that, commercial systems will not support public safety use as a primary form of communications. Reliability is not just having a clear channel all of the time, but requires portable coverage in alleys, basements, under bridges, and in many places that commercial systems have no need to cover. Reliability also includes the very basic ability of two radios to be able to fully communicate with each other without the aid of any infrastructure. This is a necessity in rural or remote areas where there may not be a commercial user base.

FUTURE SYSTEMS MUST SUPPORT AN INCREASING NUMBER OF TECHNOLOGIES AS FOLLOWS:

- Voice and slow speed data that can be carried over voice channels.
- High speed data, which includes snapshot and slow motion video as well as large file transfer, supervisory control and data acquisition, spread spectrum, surveillance, multipoint data systems.
- Full motion video.
- Personal locator, including AVL.

FUTURE SYSTEMS MUST OFFER THE FOLLOWING FEATURES:

- Technology must provide for simplex, duplex, conventional and trunked radio communications.
- Demands will further increase for encryption and efficient portable devices.
- There will be a consolidation of voice, data, image and video into a single device. The requirement for imaging will include photographs, fingerprints and maps in an efficient portable device.
- Vehicle mounted video cameras will transmit live pictures of fire scenes, high risk police activity, patient triage and hazardous chemical incidents.
- Technology must reduce the size and detectablity of covert equipment, including antennas.
- Technology must play a critical role in future spectrum efficiency.
- Future needs must be accomplished using graceful migration, both forward and backward.
- There is an ever increasing need for microwave and other backbone equipment. Florida may want to use fiber optics because of hurricanes; however, California may utilize microwave because of earthquakes. There will always be a need for fixed operational radio links to reach remote and inaccessible areas where commercial services and land-based alternatives are not available or would be cost prohibitive.
- Methods for implementing a national law enforcement and public safety digital wireless network must be addressed.

ADDITIONAL COMMENTS:

As we stand on the threshold of the 21st century, we are entering a round of new technologies and increased demands

for spectrum. The past 50 years have seen growth primarily in voice communications, but future growth will be in data, video and imaging. New communications-based technologies offer the promise of providing innovative services to protect our citizens, but most will require additional radio spectrum.

Spectrum Requirements

CURRENT NEEDS

Several studies have shown that public safety does not have sufficient spectrum to meet today's needs. In Docket 84-232 presented ten years ago, the FCC predicted a shortfall of 40 MHz by the year 2000. If projected forward to 2010 this figure would increase to 75 MHz.

All of the past growth trend projections have proven to be too low. A classic illustration is a 1985 report that estimated 155,000 mobiles and portables in Los Angeles by the year 2000. Using current figures, it now appears that there will be 240,000 mobiles and portables in Los Angeles by the year 2000. That represents a 55% increase over the original 1985 estimate.

On page 2-11 of The NTIA Land Mobile Spectrum Planning Options, there is a concise and comprehensive illustration of public safety spectrum needs. It shows the current need for spectrum, and points to new technologies that are sure to require even more spectrum in the future.

The APCO paper Public Safety Spectrum Needs Analysis and Recommendations indicates a need for 80 MHz by state/local public safety, *excluding* Intelligent Highway Systems (ITS) and point-to-point microwave. This paper was presented to the FCC in 1994. The paper projects the impact of digital and other more spectrum efficient techniques.

Public safety must take decisive action to obtain additional spectrum. This need was just enhanced by the FCC in PR Docket No. 93-144 relating to Facilitating Future Development of SMR Systems, and PP Docket No. 93-253 relating to Competitive Bidding 800 MHz SMR. This loss of access to 150 channels in the 800 MHz band must be immediately addressed. This is disastrous at the same time that demand for spectrum is dramatically increasing. These items, added to the past studies, show not only the need for additional spectrum, but in bands that are immediately available.

FUTURE SERVICES

Future systems will support an increasing number of technologies as follows:

•Voice and Low Speed Data (9.5-19.2 kps typical).

Dispatch, Facsimile, Short Transaction Processing, Snapshot

•High Speed Data (64-128 kps typical)

Decision Support, Long Transaction Processing, Slow Video,

Snapshot.

•Full Motion Video.

•Point-to-point Microwave - Where required for fixed links that

cannot be supported reliably or economically by other fixed

infrastructures for a variety of reasons.

SPECTRUM FORECAST 1996-2010

The spectrum required for state/local public safety through the year 2010 is estimated at 105 MHz, including gains from Refarming and anticipated requirements for new technology. This spectrum requirement includes at least 25 MHz for high speed data, microwave, video and other uses above 1 GHz. The remaining 80 MHz must be from bands that are compatible with existing allocations. Compatibility is required to assure both interoperability and a broad base for equipment.

The spectrum from 150 MHz to 550 MHz is generally the ideal range for public safety mobile and portable operations. The following frequency bands are requested for public safety use:

20 MHz from 380-400 MHz

There is an immediate and critical need for 20 MHz of spectrum in the 380-400 MHz band to be coupled with existing UHF frequencies. NTIA and the FCC should take immediate steps to make this spectrum available. Because the federal government controls the radio spectrum, NTIA and the FCC are the *only* agencies capable of meeting the critical and immediate needs of the public and public safety agencies.

30 MHz from within VHF TV Channels 7-13 (174-216 MHz)

This can be considered for immediate sharing in areas where channels are not currently used. Efforts must be made now to ensure that all of this VHF TV spectrum remains available for public safety use and is not placed on the auction block.

30 MHz from UHF TV spectrum in the 470-512 MHz band

This is presently shared in a number of metropolitan areas. This sharing has been accomplished with no negative impact on TV assignments. There is no obstacle to immediately extending the assignable area for these channels to many miles from the urban areas where it is presently permitted. This could result in the opportunity to migrate some small VHF High Band systems to these channels, thus freeing their channels for wide area use.

25 MHz from the 4635-4660 MHz band to be used for point-to-point and live video systems.

In addition, the federal spectrum from 1710 to 1755 MHz, scheduled for release, offers ideal spectrum for data and other wide band uses. A further limited use would be to replace long path point-to-point microwave systems which have been, and are being displaced by 2 GHz relocation actions. Major portions of this spectrum should be allocated to public safety.

This request cannot be ended without specific comments regarding the impact on the capability to protect the lives and property of our citizens if needed spectrum is not provided. Further, if these needs are not met, inadequate communications will place the lives of every fire fighter, police officer, and emergency medical responder in jeopardy. Effective communication is essential to supporting not only these first responders, but also for those general functions provided by all levels of governmental agencies. These include providing services for public welfare, general economic betterment, and basic services to the populace. While it may be appropriate to auction spectrum for non-government use, it is most inappropriate to consider auctions for public safety spectrum. If decisions are made to

provide spectrum for auctions at the expense of public safety requirements, any funds derived will be far too small. When spectrum is auctioned, it is gone forever. Inadequate public safety spectrum will severely impact the ability of federal, state and local governments to respond to incidents like the Oklahoma City bombing, California earthquakes, East Coast hurricanes and similar disasters. Citizens each year will feel less secure in their homes, jobs and while at leisure. ***The federal government's failure to properly address public safety spectrum needs will adversely impact the citizens of this nation.***

▶ Transition

SPECTRUM

New spectrum must be identified and the transition process started immediately. The proposed decision by the FCC to remove public safety as an eligible in 800 MHz General Pool channels is already having a negative impact regarding spectrum availability. The Refarming Order will be of limited short term benefit as the newly created narrowband channels cannot be utilized due to interference with existing wideband users. While the above two actions are especially harmful in congested urban areas, they will also impact many rural areas as well. A definite date must be set to discontinue the use of wideband equipment or to relegate its users to secondary status.

The public safety user community is unanimous in its belief that emergency operations are hampered by the inability to intercommunicate. As stated in the Spectrum Subcommittee report, every major disaster has shown critical problems created by a lack of operational channels and an insufficient number of common interoperable channels.

In addition to other spectrum, the Task Force specifically requests the 380-400 MHz band. Its proximity to other public safety bands and propagation characteristics make it ideal. This new public safety band should be made available to all local, state and federal public safety eligibles. The requested 20 MHz is just a small part of the large spectrum allocation assigned to DoD. This new frequency band should have channel pairing and block allocations. A number of interoperability channels should be made immediately available. Spectrum efficient technologies must be mandated from the beginning.

IMPLEMENTATION OF NEW SPECTRUM

The Task Force specifically requests that new spectrum gained as a result of this PSWAC process be developed in a block plan. The FCC, NTIA, APCO, members of the Public Safety Communications Council (PSCC), and interested users need to develop user group blocks and channel pairing and assign specific frequencies for all forms of interoperability. Coordination rules to prevent interference, while ensuring efficient spectrum use can be developed at the same time. The benefits of using a regional planning process should be considered. Such a process must be done in a timely manner, properly funded and administered.

COORDINATION & LICENSING

In the 800 MHz public safety coordinations, both in the General Category and Public Safety pools, APCO has provided excellent service to all applicants, regardless of their service classification. In addition, APCO's process includes the examination of all applications by other non-public safety. This is done without charge to protect public safety licensees.

Competition between public safety coordinators, in existing or new bands, would have a serious negative impact on coordinators and end users. A decrease in quality, as coordinators scramble to lower their operating cost to become more competitive, will most definitely result. While some of this cost-cutting will manifest itself in the form of lower end-user fees, much of it will have to be implemented within the coordinating organizations, which will invariably lead to a lower standard of service. This type of forced competition would be a great disservice to the public safety community. This Task Force does not recommend mandating competition among public safety coordinators. APCO urges this up front approach to the process, rather than an attempt to reach a compromise or an imposed solution after major problems are encountered.

Regarding licensing, should the FCC decide that it would be efficient to have a third party issue its licenses, APCO is prepared to assume this additional role. In this scenario, a conditional license valid for 30 days would be issued at the end of the coordination process. During this period, the Commission and other interested parties could perform compliance and quality checks. At the end of the 30 day period, an uncontested conditional license would automatically become the permanent FCC license. With transition to new bands and the possibility of new licensing procedures, it must be emphasized that adequate funding must be provided for Commission enforcement of regulations.

ECONOMIC IMPACT

It is essential that any new frequency bands allocated as a result of the PSWAC process be as contiguous to existing bands as possible. This will ensure equipment compatibility and keep costs at an affordable level by retaining a broad market base for equipment manufacturers.

In the event that any existing public safety licensees are relocated to other suitable and available spectrum by actions of the Commission, the licensees must be fully reimbursed in a manner similar to that used in the 2 GHz PCS proceeding. The transition to new bands must provide public safety agencies with sufficient time to make strategic plans and budget requests.

COMMERCIAL SERVICES

Commercial services can, and do, play an important role as an adjunct to public safety communications. Current uses include paging, data and access to the public switched telephone network. These uses will expand in the future. Satellite-based systems provide service in disaster situations and remote areas where infrastructure is not available. Other innovative applications are certain to become available and will be utilized when they become proven and cost effective. However, they cannot be used as the base around which to build vital operational public safety systems. Public safety systems must remain in dedicated spectrum with agency control to ensure reliability, priority access and restoration, interoperability and specific system designs to meet public safety's unique requirements.

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