

**Testimony
Of**

**Mr. Michael D. Kennedy
Senior Vice President, Americas Country Management &
Director, Global Government Relations
Motorola**

Before the United States Senate

Committee on Commerce, Science, & Transportation

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Good morning, Chairman Stevens, Co-Chairman Inouye and Members of the Committee.

My name is Mike Kennedy, and I am the Americas Country Manager for Motorola and head of global government relations for the company. We have served State and Local public safety and Federal law enforcement and their technology needs for more than 65 years. We also created the walkie-talkie for the warriors of WWII, the pager, the satellite phone, the cell phone, and now we are working to obsolete the cell phone with mobile devices that will be more like universal remote controls for life.

I want to express my appreciation to you, Mr. Chairman, for scheduling this hearing to address the need to provide timely and specific access to much-needed spectrum in the 700 MHz band to America's first responders and for other wireless broadband purposes. You and Senator Inouye have been great champions for the public safety community and the need to end the digital television transition with a fixed date.

As you know, the report of the National Commission on Terrorist Attacks Upon the United States (hereinafter the "Report") highlighted the critical need of the public safety community to have access to additional spectrum for its mission critical communications needs.

It is an honor to be here with you today to discuss how we can implement one of the recommendations of the Report that remains unlegislated and provide for a safer America by ensuring that first responders have the resources needed for life-saving communications. The horrible events last week in London further amplify the need to provide our emergency responders with the tools necessary to respond as quickly and effectively as possible.

Ending the digital television transition, as you know, also frees up spectrum for advanced commercial services. These services will enable greater connectivity for rural areas, greater competition in the provision of broadband, and new mobile applications to link people with technology's promise no matter where they may be: in the home, at work, in the car, or out and about going about living their lives.

Motorola's Technology Heritage

Motorola is a leading provider of communications and information solutions, including public safety, private, commercial wireless, cable, and wireline communications. We have more than six decades of experience in meeting the

mission critical needs of our public safety customers. We offer an extensive portfolio of solutions specifically designed to meet the rapidly evolving safety and security needs of these customers. Our solutions include interoperable mission-critical radio systems based on the P25 public safety interoperability standard; command and control solutions; identification and tracking solutions; information management for criminal justice and civil needs; and physical security and monitoring solutions.

In 2002, our public safety business in Motorola received the Malcolm Baldrige National Quality Award, the nation's premier award for performance excellence and quality achievement. We continually strive to translate the quality processes upon which this award was based into high quality and reliable communications systems for our public safety customers. Motorola works very closely with our customers to help them implement communications capabilities needed for both every day mission critical needs and catastrophic events.

Motorola invented the cell phone in 1973. Today we are leader in multi-mode, multi-band communications products and technologies and are transforming the device formerly known as the cell phone into a universal remote control for life. We are advancing seamless mobility with innovative technology solutions and delivering proven capabilities in cellular, wireless broadband and wireline access technologies, with recognized leadership in integrating core networks through wireless IP, wireless softswitch and IP multimedia subsystems. As the largest

cable set top box provider, we are providing scalable, integrated end-to-end systems for the delivery of broadband services that keep consumers informed, entertained and connected.

As a company, Motorola has also been a leader in developing and providing technology for the broadcast and cable industries. In 1947, we built one of the first affordable TV sets, which was offered to consumers for under \$200. In 1957, the company built the technology for the first pay-per-view cable event. In 1963, as TV upgraded from black and white to color, Motorola developed the first truly rectangular picture tube for color television in a joint venture with the National Video Corporation. The tube quickly became the standard for the industry. In 1972, we developed the first remote-controlled set-top box, and in 1992, Motorola helped launch the digital revolution by proposing to the government a concept that no one else had seriously considered – transitioning from analog to digital technology to drive the market to High-Definition TV (HDTV) and facilitate the recovery of spectrum.

Recommendations of the 9/11 Commission Report

The Report by the 9/11 Commission extensively reviewed how emergency responders communicated or, in too many cases, were unable to communicate, during the tragic events of September 11, 2001. The Report notes that there was substantial inability to communicate on the needed level of interoperability at the World Trade Center, the Pentagon, and in Somerset County, Pennsylvania.

While it is clear that prior coordination, advanced preparation and training by responding agencies greatly enhanced communications among emergency personnel when it was done, all too often this prior planning, coordination and training did not occur and the ability of multiple agencies to work together to maximize their life saving efforts was frustrated.

Planning and coordination can only go so far, however, to provide effective communications in an emergency. Absent proper equipment and resources communications capabilities can quickly become overwhelmed, greatly diminishing their effectiveness. Proper resources not only include radios that can interoperate among agencies using a common standard, but also spectrum to ensure the availability of sufficient system capacity. The 9/11 Commission recognized this fact and recommended that Congress legislate the expedited and increased assignment of radio spectrum for public safety.

Motorola, the nation's major law enforcement and fire fighting organizations as well as the associations representing America's cities, counties, and mayors fully support this recommendation. The spectrum referred to in the report is in the 700 MHz band. Public safety identified the need for this spectrum eight years ago in a September 11, 1996 report by the Public Safety Wireless Advisory Committee. That report, rather eerily, indicated that the 24 MHz under consideration today should be available within 5 years. As we all know, 5 years later the horrific terrorist attacks on our soil gave rise to the 9/11 Commission

which again, urged that these frequencies be made available to public safety. In the absence of these frequencies being available to public safety for their critical communications needs, the nation unfortunately is needlessly less equipped than it should be – in an area we know how to fix – to protect the American people. After the first report was published, Congress acted quickly, to allocate this spectrum to public safety in 1997. Unfortunately, since then, public safety's ability to use this spectrum has been greatly hampered or stopped in the areas where it is most needed – the major urban centers. The reason is the continued use of the spectrum for analog broadcast television services absent a date certain as to when the spectrum will be fully transferred to public safety's use. The communication needs of public safety are too important to allow this uncertainty to continue.

Swift action by this Congress can provide public safety access to one of the fundamental building blocks of an effective communications system – spectrum. Congress' commitment made in the Intel Reform bill, passed in December, to pass legislation this year to end the DTV transition was excellent, and we urge you not to be deterred.

Current law sets December 31, 2006 as the date for clearing television from the band. However, this is not a firm date. Broadcasters do not have to clear the band until 85% of the households in their service areas have the capability to receive digital TV signals, an environment unlikely to be met by yearend 2006.

Under current law, while TV incumbents are required to vacate this spectrum at the end of 2006, they can receive an unlimited extension of this deadline based on the state of the transition in their particular market. So, in reality, there is no “hard date” when the transition will end and the spectrum will really be accessible to public safety and wireless broadband service providers everywhere. This is not the optimal situation for the public safety or high tech communities and those they serve. We commend and encourage efforts by this Committee to act on the recommendation of the 9/11 Commission that legislation be enacted that would clear this spectrum nationwide for public safety as close to yearend 2006 as possible. We also applaud Senators McCain and Lieberman for their dedicated efforts to help advance this need with their SAVE LIVES Act. We eagerly look forward to the direction that you, Mr. Chairman, will take and offer our support, in advance, to you on this vitally important initiative.

Converters Can Enable a Date Certain for the Transition, Increase Channels, and Provide a Clearer Picture for Consumers with Analog TVs

While clearing the 700 MHz spectrum for public safety will affect a small number of viewers relative to the improved security gains for many, Motorola believes there are options for mitigating the over-the-air impact while affording the invaluable benefits of completing the full transition to digital television.

Completing the transition to digital television will have numerous benefits, including spectrum for advanced public safety and consumer services, enhanced and expanded viewing options for the public, more efficient use of the spectrum,

and the likelihood that digital stations will provide a wide variety of data and other services to the public.

The Congress could realize the gains of the transition as early as possible by setting a hard date for the transition, and ensuring that viewers continue to have access to free over the air television by providing inexpensive digital-to-analog over-the-air converter boxes to those that need them. A similar approach was used in Berlin, Germany to ensure a seamless and pain-free crisp analog to digital TV transition. This was achieved through the provision of converter boxes to some TV consumers who did not subscribe to cable or satellite TV service and maintained an analog TV set. We believe this is a positive step that could provide a real path forward on how to solve the transition here in the U.S. The Berlin Model worked. To make it a success, consumer education, a converter box subsidy, and a hard transition date combined for a real win. This type of approach can allow this Congress to reach a solution that addresses the needs of all stakeholders. The status quo cannot be allowed to stand. A simple technology solution that you can enable will guide the public and industry through the transition and fulfill the Committee's years old vision of making available the advanced services in the 700 MHz band that will benefit the American people.

Motorola is a TV set-top box provider. In comments to the FCC almost one year ago, we stated that -- assuming that the market is driven by a hard deadline of December 31, 2006 for the end of the DTV transition -- we estimated that the

cost of a digital-to-analog over-the-air converter box would be approximately \$67 per unit. That estimate was based on the best possible foreseeable technology and implementation information available at that time. Today, we are pleased to be able to say that our estimate was a conservative one. Suppliers are making changes that provide better integration of the converter components and prices are moving down. We would now expect that a \$67 dollar price would be achievable earlier than originally expected and believe that this downward trend will continue. We expect that by January 1, 2009 converters would be available for approximately \$50 assuming that a hard deadline for the end of the digital transition is set.

The implications of this \$50 figure are profound. Such a price per unit would peg the cost of providing one digital-to-analog converter box for every exclusively over-the-air household, based on studies by the Consumer Electronics Association,¹ at around \$660 Million. Asking consumers to contribute \$20 toward the box would reduce the government cost to around \$400 million, and also help minimize fraud. While the population will grow, these over-the-air TV numbers will continue to decline dramatically by January 1, 2009. As CEA testifies today, in 2005 approximately 12% of the nation's households rely on over-the-air TV, and at the end of 2008 they project the number to drop to 6.8%, or about 60% of what it is today. Applying this trend to the above figures, a \$50 converter box

¹ Letter dated June 7, 2005 from Mr. Gary Shapiro, CEO of the Consumer Electronics Association, to Congressmen Barton, Dingell, Upton, and Markey, citing 13.2 million over-the-air households and 38.3 million over-the-air televisions nationwide at the present.

provided to every exclusively over-the-air household would cost the government approximately \$400 million without a consumer contribution, and \$250 million with a \$20 contribution.

The cost to provide converters to those who need them is much less than the anticipated spectrum auction proceeds for the commercial digital wireless broadband licenses that would occupy the reclaimed analog TV spectrum.

Upon conclusion of the transition, viewers who receive their television programming through cable or satellite will not have to make any changes to continue using their existing analog television sets. The relatively small percentage of viewers who receive their television programming directly from over-the-air broadcasts will be able to continue using their existing television sets, although a digital-to-analog converter will be needed to do so.

The converter receives the digital signal and converts it to an analog signal that analog TVs recognize. They are easy to install and use. The converter is connected between the antenna and television using standard cables and connections. The connections are compatible with even the oldest television sets.

There are a number of advantages to receiving digital signals even while viewing an analog television. Digital TV signals are less prone to interference and

generally provide a clearer picture than analog signals. The converted digital signals are free from the "ghosts" and "snow" experienced with off-air analog signals. This provides an improved viewing experience and a significantly better picture over fair quality analog transmissions. Going digital also gives broadcasters the opportunity to provide over-the-air viewers with more channels and viewing options. With digital, broadcasters can send multiple channels of programming in the same space that one analog channel occupies. The digital-to-analog converter recognizes all of these channels and displays them independently on existing analog televisions. Many broadcasters are already taking advantage of this opportunity to provide viewers with more programming and information by providing multiple channels of over-the-air content, including additional programming or local news and weather information.

Setting a firm transition date is critical to resolve the current chicken and egg conundrum of the DTV transition. As you know, doing so will not only provide critically needed spectrum for public safety, but will also unlock new entertainment and information services for consumers and will provide additional opportunities for American industry. Wireless communications provide our first responders with the right information, at the right time and in the right place, whether that information is voice, data, or video.

Public Safety Needs 700 MHz Spectrum for Critical Technologies

Motorola's partnership with the public safety community over the years has taught us that first responders need systems designed specifically for mission critical operations to get the job done. For example, as with most of the Northeast and Midwest, the State of Michigan was confronted with a large-scale emergency during the August 2003 blackout. Despite the failures experienced by various commercial carrier networks in Michigan and surrounding states due to these power outages, Michigan's nearly 12,000 public safety radios experienced no interruptions in communications. Police officers, firefighters and EMS providers worked as a team in real time to serve the public. Michigan had control over its communications because it had created a statewide mission critical network designed specifically for catastrophic situations and events, including the disruption of normal power sources. While many public safety entities also use public carrier networks for less critical communications, there is no substitute for mission critical systems when the safety of first responders and the public they serve is at risk.

Effective mission critical mobile and portable communications systems are absolutely essential to public safety operations. Police officers, firefighters, emergency medical personnel and their departments use mobile and portable communications to exchange information that can help protect public safety officials and the citizens they serve. Traditionally, this information was mostly exchanged by voice. Increasingly, as public safety entities strive to increase efficiency and effectiveness in today's world, they also need the capability to

reliably transmit and receive high performance data, still images and video. Spectrum is the road upon which such communications travel, and increased communications requirements lead to the need for more spectrum.

Based on a thorough justification of need, Congress and the Federal Communications Commission dedicated 24 MHz of spectrum in the 700 MHz band to State and Local public safety in 1997. The FCC established specific nationwide interoperability channels within this spectrum allocation, as well as both narrowband and broadband channels to support a variety of identified public safety communications requirements.

However, eight years later, incumbent television stations operating on channels 62, 63, 64, 65, 67, 68 and 69 prevent public safety access to this essential resource in most major urban areas where the demand for more spectrum is the greatest. The recent focus on increased interoperability and Homeland Security make availability of this public safety spectrum nationwide even more critical.

These channels are critical to public safety for two reasons:

- (1) Together, the new 700 MHz and current 800 MHz bands provide the best opportunity to integrate interoperable communications. The 700 MHz band's proximity to the 800 MHz band allows public safety agencies to expand their current 800 MHz narrowband voice and data systems for interoperability and regional coordination on an "intra" as well as "inter" agency basis. Equipment operating in these combined frequency bands on the FCC-endorsed Project 25 interoperability standard is commercially available today. The FCC has granted each state a license to operate such narrowband communications in the 700 MHz band. Localities throughout the country are actively engaged in spectrum planning at 700 MHz, a prerequisite for obtaining their own FCC licenses. For example, after a yearlong review by the FCC, the Southern California regional plan was approved, but TV incumbency prevents actual use of the spectrum in much of that area.

- (2) 700 MHz is the only dedicated spectrum allocation where public safety can implement advanced mobile wide area systems that bring high-speed access to databases, the intranet, imaging and video to first responders out in the field.

This technology offers a whole new level of mobile communications capabilities, which is far beyond today's voice and low speed data applications. For example:

- a. An officer or agent could transmit video of a potential bomb, or biological weapon and get real time counsel from an expert in another location.
- b. Local or State police could instantly send or receive a photograph of a missing or abducted child.
- c. Crime scene investigators can transmit live video of footprints, fingerprints and evidence to speed analysis and apprehension of perpetrators.
- d. Firefighters can access building blueprints, hydrant locations hazardous material data and other critical information.
- e. Paramedics can transmit live video of the patient to doctors at the hospital that would help save lives.

Motorola previously conducted wideband trials together with public safety entities in Pinellas County, Florida and the City of Chicago. We are also proud to be part of the broadband demonstration that is being led by the Office of the Chief Technology Officer for the District of Columbia Government (OCTO). That system provides coverage throughout most of the District and is providing valuable information to law enforcement agents. We are proud to be working with the OCTO on an innovative solution that will deliver powerful applications to

the frontline first preventers here in our Nation's Capitol. All of these trials operate under experimental 700 MHz licenses from the FCC. The capabilities demonstrated are the emerging powerful multi-media applications that will bring public safety communications into the Twenty-First Century.

As you know, the 24 MHz of spectrum in the 700 MHz band is allocated for State and local public safety use. Congress, in the *Intelligence Reform and Terrorism Prevention Act of 2004* (Public Law 108-458), signed into law in December, directed the Federal Communications Commission, along with the Department of Homeland Defense and the National Telecommunications and Information Administration, to conduct an assessment of public safety spectrum needs to determine whether this allocation is sufficient to meet the communications needs of public safety. This effort is ongoing and is especially important as we see the demand for information, exemplified by trials like the one here in the District, grow for access to full broadband services for public safety.

In addition, while this allocation will be available for State and Local law enforcement, no comparable spectrum allocation exists for meeting the Homeland Security requirements of Federal agencies or critical infrastructure entities. Such interoperability among State and Local first responders, Federal agencies and critical infrastructure entities will best be achieved through the availability of comparable spectrum resources. These issues must be carefully

considered in order to provide a comprehensive and long-term solution that meets America's security needs.

Once cleared, the original 24 MHz of spectrum allocated to Public Safety in 1997 will support narrowband and wideband applications for State and Local government agencies. Narrowband 12.5 kHz channels provide the capacity for voice and text-like data. This will help promote interoperability as public safety entities necessarily expand their capabilities. Notably, narrowband radios which support both 700 & 800 MHz in one radio are already available. As users purchase additional radios for their 800 MHz systems, they will have the capability to use the 700 MHz band once it is cleared. Wideband spectrum at 700 MHz supports applications such as image-rich records access and higher speed video streaming over wide areas.

The Public Safety community, the FCC and multiple equipment manufacturers have already spent considerable time and resources to develop the operational and technical rules for that 24 MHz of spectrum. In addition, both narrowband and wideband interoperability standards have been developed and are supported by multiple competitive manufacturers. For example, the TIA902 SAM standard for wideband public safety operations at 700 MHz has been developed and unanimously adopted by the public safety community and multiple competitive manufacturers. Subsequently, the TIA 902 wideband standard was endorsed by the Public Safety community and specifically recommended for FCC adoption.

700 MHz Spectrum Holds the Promise of Economic Benefits and Growth

In addition to the 24 MHz of spectrum allocated to public safety in the 700 MHz band, there is 84 MHz of spectrum allocated for commercial uses. Of this, 24 MHz has already been licensed, although use is severely limited due to continued use of the spectrum by TV broadcasters. Of the 108 megahertz to be reclaimed, 60 megahertz remain to be licensed. This spectrum holds tremendous promise as a home for another generation of advanced wireless broadband services that that will provide American citizens with greater access to information and provide immense economic benefits from greater productivity.

The societal benefits of providing access to broadband services can not be questioned. Broadband access enables powerful applications. For example:

- Telemedicine so that doctors can remotely treat patients that are too frail or injured to travel to an expert medical facility, to remotely assist in a delicate medical procedure, or to transmit large medical fields or information for evaluation at an expert specialized facility.
- Telework, which allows workers to work from home or other locations outside of the regular company office. This reduces travel time to work, can increase efficiency and provide people in remote areas greater opportunities for employment.
- Digital government so that leaders can provide citizens greater access to government services through e-government initiatives.

- Advanced farming to improve and increase the efficiency of monitoring and controlling of agricultural resources, increasing crop and livestock yields by alerting farmers to problem areas and providing farmers access to the information necessary to take corrective action. These technologies can reduce the costs associated with distribution of farm products and can increase the safety of food supply by enabling better tracking of products through the production and distribution network.
- Distance learning so that all Americans have access to the best possible education on an equal footing.
- Increased access to services and opportunities for persons with disabilities will strengthen their participation in the information economy.

These are just a few examples of the almost limitless applications and opportunities provided by broadband.

While the benefits of broadband are clear, America's commitment to widespread cost effective deployment of broadband is not. The United States has steadily slipped down the broadband deployment slope compared to the rest of the world and now ranks 16th in broadband subscribers as a percentage of the population. The spectrum that will be made available at 700 MHz as a result of the transition to digital television provides a unique opportunity to provide facilities-based competitive broadband services. The favorable propagation characteristics of the 700 MHz band will allow broadband services to be initially deployed with approximately 25 percent of the infrastructure that would be necessary in the 2.4

GHz band, which is commonly used for WiFi today, considerably reducing the costs of deployment. These propagation characteristics also allow for easier penetration through and around potential obstacles to deploying wireless services in higher frequency bands. The characteristics of this spectrum make it ideal for both mobile and fixed services.

Exclusive licenses for use of these frequencies will allow operators to provide the highest quality service in terms of reliability and will provide incentives for efficient use. Such an opportunity could significantly advance efforts to provide broadband services to all Americans.

The economic benefits of this spectrum are enormous. Estimates of the auction revenues from this spectrum range from \$10 Billion toward \$30 Billion. This pales in comparison, however, to the economic benefits to society. When considering such implications as increased productivity for the Nation and lower costs of services to consumers due to making this spectrum available for better uses than merely analog TV, the economic benefit to America was recently estimated at \$233 billion to \$473 billion dollars in a report by the Analysis Group.²

Significant steps have already been taken that will provide for rapid commercial use of this spectrum when it is fully available. Standards bodies, including the 3rd

² *Analysis of an Accelerated Digital Television Transition*, Colman Bazelton, Analysis Group, May 27, 2005.

Generation Global Partnerships and the Telecommunications Industry Association have already adopted standards for use of technology in this spectrum.³ Standardized technology will lower the cost of equipment and provide for rapid acceptance of equipment and services. In addition, companies that have licenses in this spectrum band have begun to deploy systems in the limited areas not encumbered by broadcast stations. For example, Qualcomm has developed its MediaFLO™ system to provide voice and data multimedia to mobile devices. Such innovative technologies hold the promise of providing consumers with access to exciting new levels of information and entertainment.

In closing, Mr. Chairman and Members of the Committee, We urge you not to be deterred from sticking as close as possible to the original December 31, 2006 goal. Making this spectrum available for new innovative technologies to support first responders and consumers nationwide anytime near the end of 2006 will not happen without you. The Report of the 9/11 Commission has reaffirmed the need for this spectrum and added new impetus to making it available to our Nation's 1st Responders. We urge you to take swift action this year to make this important long-awaited objective a reality for law enforcement, fire fighters, emergency medics, and your constituents. As we have just seen, our allies in London were attacked by terrorists. All of the experts tell us that it is not a matter of if, but when, will they strike us here again. Communications tools are vital in

³ See, TIA standard TIA-1030 http://www.3gpp2.org/Public_html/specs/C.S0057-0_v1.0_020904.pdf and 3GPP TS 45.005 (http://www.3gpp.org/ftp/Specs/archive/45_series/45.005/45005-710.zip).

these emergencies. We know this and we know how to make them available – it starts with ending the DTV transition.

Motorola stands ready to support this Committee to help minimize the impact on the viewing public of making 700 MHz spectrum available and to put this spectrum to its highest and best use – protecting American citizens. We respectfully urge the Congress to take action to implement the recommendation of the 9/11 Commission to make the 700 MHz spectrum fully available to public safety by a date certain as soon as possible.

Thank you.