Comments to New York City Council Concerning White Space Devices

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Good Morning. My name is Dharma Dailey. I am Director of Research for the Ethos Group, a consulting company which focuses on the social impact of local broadband. For the last two years I've been working with hardware and software developers, policy analysts, network deployers, social scientists and local community activists who pursue evidence based knowledge of the conditions under which broadband projects have a positive social impact at the local level. Thus far, our work at Ethos has focused on how researchers and practitioners in this emerging field can collaborate more effectively together. Because my work is focused on "in field organizing" or "in field analysis" my comments today are based on the collaboration with dozens and dozens of experts working worldwide, but primarily those working in the North American context.

Unlike most of the experts who are weighing in on what should be done with the White Spaces, I neither represent nor favor any industry perspective on the issue. Rather, I've spent 15 years dedicated to solving the substantive and persistent communication gaps that exist at the local level across our country. In 2003, after seven years of being active in the push for expansion of community radio via expansion of low power fm services, I was asked by my community media policy colleagues at the Prometheus Radio Project and the Center for International Media Action to identify new technologies and new policies that have the potential to solve problems similar to those that community groups look to solve through old fashioned community radio. In the development of new services, the industry norm is top heavy among both developers and service providers who use the public airwaves as a delivery mechanism. They identify potential new services in house and determine first how well those services fit into their existing business model, then second, if their customers would appreciate this new service. "Will our customers buy this services which we are willing to sell?" My colleagues and I work in the opposite direction, we seek to identify existing persistent communication gaps as identified by local communities and ask, "What will solve this communication problem for these people?"

There are three things that I hope to address in my testimony today. First, I've read the draft statement to the FCC that the council is considering. I believe that there are some inaccuracies or misperceptions both about how the FCC works and about how white space devices work which I would to clear up. Second, because the New York City council should not adopt any resolutions which are harmful to rural areas I want to highlight to the council one important potential use of white space devices, namely solving issues of rural connectivity. Finally, I think it's very important that the decision makers in DC: the FCC, the NTIA (also involved in spectrum allocation), and their bosses in Congress hear from city councils across the US about the hopes and aspirations that your constituents have to use the public airwaves in the coming years. I want to give some guidelines to the council on what I think would be best to ask for. I hope that my testimony will raise questions for the council. I'll be happy to follow-up with the council as needed.

By no means am I giving an exhaustive comprehensive overview of what's possible. Instead, I suggest that the Council calls up FCC engineers, sets up a meeting with them, looks at the background materials that they've developed to educate policy makers on the possible uses of what they call "Cognitive Radio Devices," more frequently called "Smart Radio Devices," and what you are calling "White Space Devices."

For over a hundred years, there has been a a steady progress on technologies which allow for more intensive use of the airwaves for over one hundred years. There's no reason to think that this trend is ending at any time soon. Consider the precision of current electronic devices like retinal implants. Last week I was in Washington, DC at an event where FCC engineers were in attendance. One of the them was explaining what was currently on his desk for approval, Retinal Implants. These are electronic devices about to go on the market which are so precise that they work exactly in concert with the electric pulses of your brain with at just precisely right amount of power at just precisely the right frequencies. The result is they can give restore sight to blind people. This kind of precise use of electronics is long overdue for devices that use the airwaves.

The novelty for most of the technologies that are being called in this hearing "white space devices" is not the technologies themselves, but in the application of those technologies. For example, the concept of spread spectrum as a tool for more intensive use of the the airwaves was conceived in the 1940s. For 40 years it was a top secret technology of the US Military. It became a core technology for cell phones in the early 80s. Spread spectrum allows for tens of thousands of simultaneous cell phone calls to be handled on the same frequency. There is no technical reason that spread spectrum can't be applied without interference to other areas of the public airwaves such as those frequencies in used by wireless microphones.

The fact is that everyone views the public airwaves as an extremely valuable asset. If you have an exclusive right to use such a valuable asset, why would you ever allow that right to be diluted if you could possibly avoid it?

Community radio advocates have observed for decades in radio policy is that when that incumbent broadcasters can't openly argue that they should have exclusive rights to use the airwaves. It's a very unpopular argument. Instead they argue the technical merits. The National Association of Broadcasters would look like right fools if they went to the FCC and said, "We're concerned that tiny 3 watt stations that broadcast to city block or an suburban neighborhood would fracture our market share. Keep them off the air." Instead they say, "Tiny neighborhood radio stations will make airplanes fall out of the sky." And the FCC engineers, who have a public mandate to engineer on the public's behalf have said, "No, old fashioned community radio, we can fit a lot more of those on the dial all over the place." But, arguing the technology gives political cover to Congress, to the FCC Commissioners and other political operatives to argue in favor of the industries that they want to champion.

Licensing and Unlicensing. Reading between the lines of your resolution, I see a common misperception that is often perpetuated by incumbent broadcasters. That's is the distinction between licensed and unlicensed devices. The FCC does not allow anyone to willy nilly use the airwaves. They have two separate licensing regimes, between the two, all forms of radio based communication available to the public are covered.

The first regime is called "licensed." That means that an individual or an institution is granted a right to serve the public convenience and necessity by having exclusive use of a specific frequency within a specific geographic area. Almost all of the frequencies which the FCC has the ability to allocate for use have been allocate under the license regime. You cell phone companies, broadcasters, satellite companies, emergency radio service providers, and so on.

The second regime is confusingly called, "Unlicensed". Under "unlicensed" the FCC still grants a license, but instead of granting it to an individual they grant it to a device. These licensed devices which are licensed by the FCC under the "unlicensed" regime known in the trade as Part 15 devices include baby monitors, microwave ovens, garage door openers, remote controls, Mr. Microphones and wi-fi.

Part 15 was practically an accident. Incumbent users of the public airwaves are usually the first in line to take advantage of any new frequencies that come available, but incumbents couldn't figure out how to commodify certain frequencies known as the "junk band." So the FCC developed the unlicensed regime which allows anyone to innovate on use of those frequencies as long as they meet specific engineering requirements.

Part 15 is a much newer regime that has been wildly successful from an economic point of view. All kinds of devices have sprouted up from that regime in a relatively short time. The possibilities that we've seen, especially with wi-fi, give hop to advocates of local communication services. Though localism is supposed to be a guiding principal of Communciations policy in the United States, Small and mid-size cultural, civic, and economic institutions, and small goverment have a very hard time navigating the licensing regime. The barriers to entry are numerous. Frequencies for license are either auctioned which favors very large economies of scale or they are given away in "licensing windows" which favor entities who know how to work the FCC. Licensing encourages speculation on frequencies and frequency squatting.

Community media allies, like myself are fighting for expansion of public use of the public airwaves under both licensed and unlicensed regimes. But looking forward in consideration of existing technologies, technologies in the cue, thoughtful comparison of licensed and unlicensed regimes, we believe that unlicensed devices, hold more

promise at the moment to fill the many communication gaps that exist at the local level across America.

Without question the technology exists allows cultural institutions to share the airwaves with their neighbors. The FCC engineers are competent people who follow the rules they are given. But even if they did not exist, it would be in the public interest to invent them.

I hope that policy makers all over are considering how to create robust, terrorist proof, flood proof, earthquake proof, broadband networks which are logically laid out to meet the demands of the public health, educations, and safety as well as civic, cultural, and economic development.

It's estimated that fiber has an life 30 to 50 years. Which means that in all likelihood looking at fiber networks will be the core communications infrastructure for the next 100 years.

But Laying fiber is expensive. And in spite of the efficiencies that future proof robust networks can provide, it's hard to get all the stakeholders to align behind a build out that is going to meet everyone's needs.

In most places in the US, there is what's called a "Point of Presence" meaning there is a place where good broadband connectivity comes into our communities somewhere within several miles of most of us. And in most places in the US, there is competition up to that "Point of Presence." But spiraling out from that point of presence there is arguably no competition and arguably no broadband. In some places two providers -- maybe cable and dsl -- in some places only one provider- just cable of just dsl, and in other places there are no broadband providers. Cable and DSL are stop gap technologies that won't be considered broadband in a few years. They are legacy networks that were not built for the kind of uses that people are beginning to want. But even if we except that they are broadband, PEW Internet research latest report indicates in 2008 only 38% of rural Americans have broadband service. That doesn't count whether that service has acceptable terms of use which allow users to use the service as they like or whether the services delivers as promised. "High speed" is simply defined by whatever one or maybe two providers are selling.

I live in Greene County New York which is typifies the problems that we have in rural areas in the US. Recently I spoke with a broadband advisor to former Governor Spitzer who told me that he had familiarity with my county. He used a single word to describe our communications infrastructure: "Hopeless." In context, I believe that he was not only discussing the infrastructure, but also the lack of vision in the County. In preparing

for the hearing, I spoke with a county economic advisor who told me that it was "invasive" and "inappropriate" for the county to keep track of where communication services are available for county residents.

Maybe this explains why some of my neighbors, like 28% of rural americans (according to Pew) can't get broadband service at any price. Like most in my county, I have only on option for available for broadband and the service is not up to the quality I'd like. The cables are strung up on the telephone poles. We have regular weather related outages. These can last for hours. For my neighbors, this is an inconvenience because they miss out on watching television. My livelihood depends on connectivity. For me it's a productivity issue.
There is no singular magic bullet that will solve the many problems that we Americans have trying to lurch into the 21st century on 20th century networks. But one part of the answer is to have wireless devices that can make the leap from our the point of presence in our communities where their is competition and good connectivity to our homes and businesses.

There are places in this country where after 100 years of land line phone service, we still have communities that don't have phone service. Usually, these are areas of poor people of color. There are many more areas where cable television service have not reached. Because companies self-report, there coverage area maps don't always match reality. Poor and remote communities in the United States are unlikely to be getting fiber any time soon.

But we aren't asking for spectrum squatters to give back all of the spectrum under their domain. We are not demanding that any industries are put out of business. We are asking the FCC, that that incumbent users of the airwaves are restricted to using just enough spectrum and only enough spectrum to do what their licensing agreement with the FCC states. We think that the remaining spectrum is enough to launch a new wave of useful communication devices without causing technical interference. New communication devices may cause interference with incumbent business models. But that is called competition. It's what America is about.

Recommendations

"This resolution, ... negatively impact television broadcasters, performing artists, professional sports leagues, and all incumbent wireless microphone users." As this resolution currently reads, the New York City Council is asking for the FCC to consider the impact of their policies on the largest, most resourced cultural institutions that exist in United States. There are thousands of lawyers and engineers working on behalf of incumbent users of the airwaves. These experts are in regular communication with the FCC, in Congress, in state capitals, and sometimes city councils all across America. Everything, in Communications Law, everything in FCC procedures and rulemakings considers incumbents, and in nearly all cases, favors incumbents.

A braver step the city council would be to encourage the Congress and the FCC to progressively allow more intensive use of the public airwaves by the public which is mapped directly to technologies which allow for more intensive use. Broadband is considered a fundamental infrastructure for development in the 21st century. We,should continually look for ways to simplify licensing regimes to lower the barriers to entry to the point where they are accessible to community level actors to create new communication services where they are needed when they are needed.

The public's expectations for how devices that use the airwaves should work has changed. We, including the city, are asking the FCC to shift it's rules to accommodate those new expectations. It's not about the technology. It's about focusing public demand. We all want a regime that makes it easy for artists and other to easily create more ad hoc services exactly like those that accommodate a live theatre

performance. We need to ensure the FCC and their bosses hear this mandate from all quarters: We want laws, rules, and procedures that put us on a trajectory that makes it ever easier to deploy ad hoc on-demand services as they are needed by civic, cultural and economic ventures of all sizes based on ever more savvy sharing of the public airwaves.

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New York City White Spaces (WS) Opportunity

Technology in Government Committee Hearing, September 29, 2008
Chair: Council Member Gale A. Brewer
Comments: John V. Weaver

EXECUTIVE SUMMARY

HIGH SPEED BROADBAND:
Since 2001, the U.S. has fallen from 3rd to 16th in worldwide broadband adoption. This retreat seriously threatens New York Cities (and Americans) potential competiveness in the "Digital Age".

The opportunity to rapidly implement Wireless Broadband can help to "leap-frog" this lapsed focus on New York City's future prosperity. The prospect of accelerating affordable, ubiquitous, high-speed Internet connections to bandwidth-starved students who can then facilitate digital age business formation and job creation should be the cities top economic development priority.

Further to support all of our young entrepreneurs it is essential that broadband services be made available to New Yorkers currently excluded from the digital revolution.

EDUCATION:
The kinetic energy of our student body intercoursing through our Schools and Libraries can be empowered by ultra-broadband connectivity. The product of this activity will foster a resurgence of the creative force that is the historic hallmark of the world's most international and intellectually diverse city.

EMERGENCY FIRST RESPONDERS:
September 11 and Katrina demonstrated that giving our public safety agencies reliable, interoperable video, voice and data communications is a matter of national security.

ENHANCED SECURITY
The favorable transmission and bandwidth characteristics of WS will enhance video security applications for commercial, residential, and government applacations.

WIRELESS MICROPHONES:
FCC Docket (08-166) has been opened to examine this issue and Certification Specifications are being developed to permit manufacturers to legally license wireless microphones after February 9, 2009.

MYTHS VS FACTS:
MYTH: WSDs could disrupt the Digital TV transition.
FACT: The DTV transition will be over before any personal/portable WSD is permitted to operate in the band. The FCC's First Order and Further NPRM in October, 2006, specifically prohibits the marketing or sale of WSDs until after the February 2009 transition deadline.

SUGGESTED INITIATIVE:

Thinking out of the Box, let's try to imagine a "New York City WS Development Enterprise". Its immediate agenda would be to establish priorities, coordinate a citywide development strategy, secure a government tax incentives / private capital partnership and execute the plan.

SUGGESTED GOALS

1. **100Mbit WS broadband internet capability to all schools and libraries rolled-out starting in mid 2009.**
2. **Over the next five years scale system up to a 1GBit capability.**
3. **Design Private and Public educational training to scale up New Yorker's to operate computers at this level.**
4. **Establish Private and Public education offerings to assist entrepreneurs in the basics of ecommerce and other skills essential to developing WS devices and software applications.**
5. **Develop Professional Business Collaborative's that cost effectively eliminate administrative and legal burdens of small startup businesses.**
6. **Establish an initial investment pool of $100,000,000 dollars to develop and dominate WS economic development and establish New York City as WS Central.**

THESE ONES FOR THE HOME TEAM

New York City WS Opportunity

City Council Hearing September 29, 2008
Chair: Council Member Gail Brewer
Comments and Explanations
John V. Weaver

HIGH SPEED BROADBAND:

Since 2001, the U.S. has fallen from 3rd to 16th in worldwide broadband adoption. This seriously threatens New York Cities (and American) potential competiveness in the "Digital Age".

The opportunity to rapidly implement Wireless Broadband can help to "leap-frog" this lapsed focus on New York City's future prosperity. The prospect of accelerating affordable, ubiquitous, high-speed Internet connections to ultra-bandwidth-starved new digital age innovators as well as providing essential services to my fellow New Yorkers currently excluded from the digital revolution should be the cities top economic development priority to facilitate 21st century business formation and job creation.

The judicial development of WS spectrum in New York is limited to about 20% of the new available spectrum. Consequently it's desirable to establish a short list of critical applications to be developed on a fast track.

TV WSs will increase accessibility to more reliable broadband networks, known as "mesh networks." Mesh networks are self forming networks created by consumer electronics devices. Devices will simply find each other in the same way they find Wi-Fi hot spots today and broadband traffic can be routed through devices based on consumer preferences. For example,

mesh networks will allow users wireless connectivity in the business environment. Easily accessible connectivity to office networks will generate efficiency in routine business processes-from printing documents remotely to transferring data to a client during a meeting.

Mesh networks also help to create connectivity in dead zones. These networks make it possible for the most common electronic devices to communicate with each other to resourcefully locate and establish a connection in nontraditional scenarios—like in a tunnel, or while riding the subway.

Community networks like the Muni Network being developed on Long Island will provide Wi-Fi across Nassau and Suffolk counties. The project will cover 750 square miles and provide access to nearly 3 million residents. The Wi-Fi Long Island system is intended for use by residents, businesses, government agencies, schools, organizations and tourists and this service will be crucial for attracting businesses and tourists and giving Long Island a competitive advantage.

EDUCATION:

The kinetic energy of our student body intercoursing through our Schools and Libraries can be empowered by ultra-broadband connectivity. The product of this activity could foster a resurgence of the creative force that is the historic hallmark of the world's most international and intellectually diverse city.

Globalization is expanding the playing field for schoolchildren around the world, changing the dynamics of how they compete on the world stage. We the Adults have a responsibility to give New York's schoolchildren the tools they need to meet new challenges and capitalize on new opportunities. Connecting New York schools where over 150 languages are thought and spoken fluently with the global economy by way of the internet with a minimum of 50MBits scalable to 1GBit will profoundly accelerate learning and economic development.

WS could help provide students with access to information, enabling them to communicate – and compete – with their peers around the world. For example Ultra-Broadband internet capability could:

- Provide high schools and middle schools assets already on campus at major universities with mobile, high-speed Internet access at every desk and every student and teacher equipped with a laptop.
- Increase the reliability and decrease the cost of video conferencing on college, in library's and community centers enable distance learning for students to reduce the time and cost of transportation.
- Could facilitate student learning by allowing classrooms to connect to the Internet via hotspots or mesh networks.
- Along with ultra-broadband connectivity, WS could provide lower-cost access to schools with limited resources.
- Facilitate distance learning, allowing teachers to quickly post student progress information and respond to requests from parents and students.

EMERGENCY FIRST RESPONDERS:

September 11 and Katrina demonstrated that giving our public safety agencies reliable, interoperable video, voice and data communications is a matter of national security.

In emergencies, TV WS can be used to augment public safety communications on licensed networks. For example, rescue efforts could be enhanced by placing portable, remote video cameras at a disaster site to relay real-time images to a command center; point-of-view command/control information; or to establish self-forming mesh networks that enable communications to help First Responders better care for disaster victims by providing:

- Emergency Disaster Response – Trailer-mounted communications towers run on solar power and can be set up at a disaster scene located outside of a city's wireless network. These "towers on wheels" can facilitate communications in an area where the infrastructure has been damaged, linking with a municipal and allowing public safety officials to use devices such as handheld PDAs, emergency VoIP phones, computers, and video surveillance cameras.
- Self-forming Mesh Networks – Self-forming mesh networks enable the delivery of communications at emergency sites and in the event of catastrophic network failure or when an existing communications infrastructure is damaged or unavailable.
- Aerial Video Surveillance – Aerial Video Surveillance provides safety officials with a live aerial view for routine surveillance or to a major events or disasters. With Aerial video surveillance, an "eye in the sky" transmits video images back to the ground via the city's unlicensed wireless mesh network.
- Automated Vehicle Location – Automated Vehicle Location uses global positioning system (GPS) technology to rack and pin-point a public safety vehicle's location, elevation, and velocity using a map located at each dispatching station.
- Mobile Data Computers – Mobile data computers use a city's unlicensed wireless network to run high-end applications such as in-car streaming video and car-to-car messaging in public safety vehicles. They also allow safety officials access to sex offender databases, mug shots, and satellite imagery.
- Electronic Field Study – City unlicensed wireless networks allow police and fire officials to view images such as maps and building floor plans, from their vehicles, allowing them to make logistical decisions before they arrive at the scene.

CONVENIENT CONSUMER PRODUCTS, CONNECTING COMMUNITIES AND ENHANCED SECURITY

Imagine broadband connectivity, anywhere—in the palm of your hand, in your car, at work, or in your living room.

The favorable transmission and bandwidth characteristics of WS will enhance video security applications for commercial, residential, and government purposes. Examples of security applications using the TV WS include perimeter video surveillance; robust wireless secure area monitoring; and in childcare facilities.

TV WS would help achieve that vision by delivering hotspots and self-forming mesh networks and connected consumer devices. Consumers could access information in a wired or wireless manner, over desktop or handheld devices, in a stationary, portable, or mobile manner.

- TV WS also make information access quicker by lessening congestion on broadband networks; much like an extra traffic lane reduces traffic jams.

- A number of municipalities across the nation are already deploying first-generation wireless local area networks to provide broadband access to the public. Use of TV WSs could increase the service quality and decrease deployment costs for municipal broadband networks.
- The favorable transmission and bandwidth characteristics of the TV broadcast spectrum could enhance video security applications for commercial, residential, and government purposes. Examples of security applications using the TV WS include perimeter video surveillance; robust wireless secure area monitoring; and childcare monitoring in the home or in childcare facilities.
- Municipal Broadband Access for municipalities to the nation is already deploying first generation wireless local area networks to their citizens – and to make local government services more productive for taxpayers. Use of the TV WS for such municipal broadband networks could increase the quality of service and decrease the deployment costs for such networks.

WIRELESS MICROPHONES:

A proposal is before the FCC for rulemaking to establish a "General Wireless Microphone Service" (GWMS) category for the purposes of licensing these devices.

FCC Docket (08-166) has been opened to examine this issue and Certification Specifications are being developed to permit manufacturers to legally license wireless microphones after February 9, 2009.

- IEEE P802.22 established to develop solutions for fixed wireless not mobile devices like WSD.
- Major potential issue is that unauthorized use of spectrum (i.e. wireless microphones) operating in concentrated "pools" could interfere with new "Advanced Wireless Service" (AWS) emergency communication services being implanted following the transition to Digital transmission. This may affect entertainment centers like Broadway.
- FCC Regulation "Only broadcast licensees and networks, cable TV system operators, motion picture and TV producers, and licensees of the former MMDS/"wireless cable" service[2] may use Part 74, Subpart Hvwireless microphones (hereinafter "wireless microphones").[3] *See* 47 CFR §74.832(a). Further, this narrow class of users must apply for a license to operate the systems, and may use these wireless microphones only for limited purposes related to the production of television or cable programming or the production of motion pictures. *See* 47 CFR §74.831."
- Over the years, however, the manufacturers – particularly Shure, Inc. -- marketed and sold equipment to houses of worship, theaters, musicians, DJs, karaoke enthusiasts, business meeting hosts and convention centers members of the general in violation of the Commission's rules.
- To illustrate the dimensions of the problem, fewer than 1,000 active licenses for low-power broadcast auxiliary service are in force in contrast it is estimated "400,000 unlicensed wireless microphones in use in 2006 by concert halls, musical theaters from Broadway to elementary schools, houses of worship, film sets, sports arenas, conferences and conventions, and karaoke bars.

- *Although a lot of people ignore the fact, wireless audio systems actually require a License and are really only supposed to be operated in the TV band by broadcasters and media producers.... According to industry expert Greg Stanfill, only about 10 to 15 percent of the systems in use in the United States are properly licensed. Stanfill, who was president of wireless audio pioneer Vega Systems for 18 years, told Mix: in theory, you can be busted for this by the FCC, but unless you are incredibly stupid which has happened, but not often you'll get by with a warning.*

- The digital transition makes the rules violation impossible to ignore. The Commission therefore cannot continue to ignore the possibility of "pools" of harmful interference that may undermine consumer adoption of commercial systems and create a serious risk to public safety, especially where ineligible users make intense use of wireless microphones, unaware of the unauthorized nature of their use and their possible interference with these new systems.

MYTHS VS FACTS:

MYTH: WSDs could disrupt the Digital TV transition.

FACT: The DTV transition will be over before any personal/portable WSD is permitted to operate in the band. The FCC's First Order and Further NPRM in October, 2006, specifically prohibits the marketing or sale of WSDs until after the February 2009 transition deadline.

MYTH: WSDs will not adequately sense channels occupied by licensed TV broadcasters.

FACT: The FCC's Office of Engineering and Technology report, documents that the Philips "Prototype B" was 100% successful at sensing occupied TV bands at the weakest signal level within the device's technical specifications (-114 dBm).7 The FCC also measured how well the device operated at even weaker, out-of-spec measurements of -116 dBm, -117 dBm, -118 dBm, and -119 dBm. Opponents of WSDs only reported the results at -116 dBm, choosing to ignore the perfect performance of "Prototype B" at -114 dBm.8 However, requiring detection and avoidance of a TV station even at -114 dBm is arguably too strict, since this level is far weaker than a DTV receiver needs to actually display a picture – DTV receivers need a signal power level that is 1,000 times more powerful (roughly -85 dBm) to actually display a picture.

MYTH: Feasibility testing this year by OET is the same as FCC device certification.

FACT: The prototype testing recently conducted by the OET focused on determining whether WSD technologies were *feasible* for personal/portable uses, and on determining the appropriate operating parameters for such devices. Devices sold to consumers must first undergo a rigorous FCC certification process to confirm that they will operate pursuant to the actual technical specifications for interference avoidance.

MYTH: WSD transmissions will cause harmful interference to TV broadcasts on immediately adjacent channels.

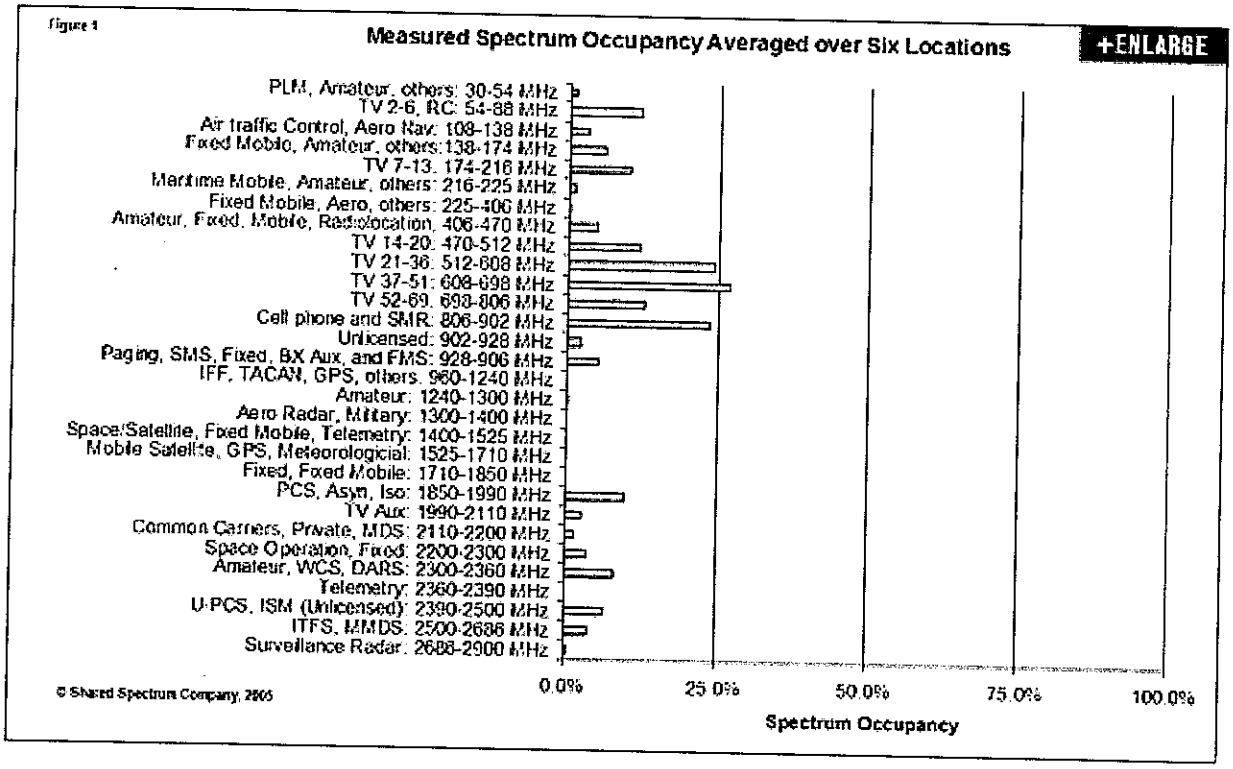
FACT: The Public Interest Spectrum Coalition worked with researchers at the University of Kansas Information and Telecommunication Technology Center (ITTC) to study the feasibility of building WSD transmitters that would not cause harmful

interference, even to neighboring channels. WSD transmitters operating at fewer than 100 milliwatts did not cause harmful interference to TV broadcasts on neighboring channels.

MYTH: Unlicensed devices will harm existing TV broadcasts.

FACT: The vast majority of wireless microphones are themselves unlicensed devices and have been using vacant TV channels for many years (most of them illegally) yet without complaints of interference.

MYTH: Current uses of TV bands are efficient.



FACT: The University of Kansas Center for Research conducted a series of tests of actual spectrum use as a part of its study, "Spectrum Occupancy Measurements and Pre-Selector Development National Radio Research Testbed (NRNRT)."14 This research documented the massive inefficiencies in today's uses of the public airwaves. Researchers measured spectrum use in Great Falls, VA; Tysons Corner, VA; Arlington, VA; New York City, NY; Greenbank, WV; and Vienna, VA. The results from these tests document that the vast majority of spectrum remains unused. Even within the TV Bands a vast majority of the spectrum remains unused (see figure below). A New America study found that after full-power TV stations switch to digital-only broadcasting in February 2009, the vacancy rate among the 49 channels reserved nationally for DTV will range from 20-to-40 percent in congested, coastal markets like Trenton N.J., to 80 percent or more in rural markets.

MYTH: There is no way to prevent mobile unlicensed WSDs from broadcasting in unassigned TV channels used by wireless microphones (e.g., at a Broadway show or National Football League game).

FACT: Many options are available to venues that want to ensure that WSDs are not operating on specific frequencies being used by wireless microphones. First, automated sensing of frequencies utilized by wireless microphones is being integrated into prototype WS devices themselves and can prevent harmful interference. Second, the FCC's original 2004 NPRM stated that venues can require patrons to turn off their cell phones and other wireless devices, much like theaters, airlines and other venues specifically request today.

MYTH: Licensing WS spectrum could generate substantial auction revenue.

FACT: TV WS is ill-suited for licensed services and would raise only a small fraction of the revenue that is expected from unencumbered spectrum (such as the 700 MHz spectrum TV channels 52-69). TV WS is "swiss cheese" spectrum – each of the nation's 210 TV markets has a different set of channels in use, thus there are no nation-wide clear channels. In addition, WSDs – whether licensed or unlicensed – would need to operate at very low power and operate on a secondary basis to DTV and wireless microphone licensees.

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THESE ONES FOR THE HOME TEAM

Attachments:
NY Times, Smartphone Start-Ups Have a Friend in this Fund, August 22, 2008
NY Times, Tax Credits Bring More TV Shows to New York City, September 25, 2008
Nuvation: IPv6: Embedding the New Version of IP Spring 2008

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IEEE, EE Times. TV Spectrum White spaces: The big guns battle it out, August 25, 2008
FCC: Informal Complaint and Petition for Rulemaking; Petition to create a General Wireless Microphone Service July 16, 2008.
NYU Law journal "White Space Devices" & the Myths of Harmful Interference September 9, 2008
New America Foundation, the Case for Allocating Unused Spectrum in the Digital TV Bands to Unlicensed Use for Broadband Wireless Innovation. August 2006
New America Foundation: the Rhetoric and Reality of Progress in Allocating More Spectrums for Unlicensed Use. February 2006

The American Federation of Musicians

Ensuring that "White Space" Devices Are Safely Produced and Sold, Without Causing Interference

The Federal Communications Commission (FCC) is currently testing mobile Internet devices designed to operate in the "white spaces" – the frequencies between television channels. This is a very risky proposition that can have devastating effects on live concerts, Broadway productions, symphonic performances, and any event that uses wireless microphones. These Internet devices will operate on frequencies close to -- or even on top of-- those used by wireless microphones that there is a very high chance of interference, thereby ruining the audience's experience.

A powerful coalition, consisting of Google, Microsoft and other tech giants are lobbying the FCC to allow these devices. However, the Microphone Interest Coalition, consisting of AFM, Shure Microphones, the Recording Academy, The Broadway League, the Grand Ole Opry and others, is lobbying the FCC to continue rigorously testing these devices and to not license the production of these devices until it is clear that they will not interfere with wireless microphone use.

Those tech companies lobbying the FCC argue that their devices are working properly and that beaconing technology – technology that can be installed in conjunction with microphone systems to let "white space" devices know that a certain frequency is occupied – is an appropriate compromise. However, neither the "white space" devices nor the beaconing technology have successfully passed FCC tests.

AFM is working very hard to ensure that the FCC rigorously test these devices and technologies in order to guarantee that live concerts and theatrical productions can be properly enjoyed by all. Furthermore, any technology designed to prevent interference between wireless microphone users, "white space" devices and broadcasters must be thoroughly tested and affordable for incumbent wireless microphone users.

Background Information:

In 1974, the FCC authorized wireless microphones for professional use within the Television Band. In doing so, it recognized that professional theaters and concert halls need wireless microphones that can deliver very high quality sound instantaneously. The only frequencies that allow wireless microphones to deliver such a high quality transmission were the spectrum frequencies used by the television broadcasters. Therefore, the FCC authorized professional wireless microphone use as the "secondary" use of the spectrum frequency allocated to the broadcasters.

As secondary users of the television broadcast spectrum, professional microphone users took advantage of the "white space" between television channels, as it still does today. For 35 years, performers and theaters have been using the "white spaces," as the FCC has authorized, without interference between those microphones and the television broadcasters.

The primary reason that interference with the broadcasters and other wireless microphone users has been avoided is because the incumbent organizations that use wireless microphones have those microphones professionally coordinated. Professional sound engineers work with broadcasters and others using the "white spaces" for wireless microphones to see that all users are operating on a separate frequency, with sufficient space between the frequencies, in order to ensure that there will be no interference.

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Written Testimony of
JOSHUA BREITBART
POLICY DIRECTOR, PEOPLE'S PRODUCTION HOUSE
before
THE COMMITTEE ON TECHNOLOGY IN GOVERNMENT
on the topic of
"THE REGULATION AND USE OF THE UNALLOCATED PORTION OF THE RADIO SPECTRUM, ALSO KNOWN AS WHITE SPACES"

September 29, 2008

Good morning. My name is Joshua Breitbart. I am the Policy Director of People's Production House. People's Production House provides young people, immigrants, and low-wage workers with a comprehensive education for the information age, combining media production, media literacy and media policy. We work in public schools and with community organizations in all five boroughs.

The certification of low-power white space devices (WSDs) is the single greatest step we could take towards closing the digital divide in this country and it will not cost the taxpayers a dime. In fact, it will save us money and it will stimulate our economy, locally and nationally. It is distressing to me and all of my organization's members that you would oppose this measure, as the draft resolution suggests. The current draft resolution does not even mention the digital divide.

This resolution, as currently drafted to discourage certification, would be harmful to the work of People's Production House and to our city. I say this as someone who has been very supportive of this committee in the past. You have done so much to bridge the digital divide, use technology to improve government, strengthen New Yorkers' experience of technology, and boost our local economy, which is increasingly reliant on technology and telecommunications. This draft resolution runs counter to all of those goals.

It is sad to see an otherwise forward-thinking group of legislators propose a resolution so filled with fear and confusion. But why should I be surprised? The only thing the major broadcasters and wireless microphone companies have on their side is fear. Engineering, the law, the economic health of our city, and the moral imperative of closing the digital divide are all on our side, in support of device-certified access to the white spaces.

The proposed resolution is simply bad policy. My written comments contain a full analysis of the resolution, including its factual errors, omissions, and misrepresentations, of which there are many. Members of this committee should ask for references to back up the claims in the resolution before you go on the record supporting them.

Since this is a technical issue that can be hard to engage the public on, People's Production House has produced two educational videos to explain what white spaces are and why they are important. One is an animated history of our airwaves; it is three and a half minutes long. The other is a two-minute examination of the problems immigrants face using pre-paid calling cards to call friends and family in

other countries, which white space devices would help solve. I have included these on a DVD with my written comments. Please watch them and show them to your constituents. These videos are also available on the Internet at our white spaces website, www.speakandlisten.net.

To make this dense issue even more confusing, the Committee Chair and Counsel have both assured me personally that this resolution, while asking for the FCC to takes its time in making a decision, actually supports white space devices. Then why does it not say that?

Why can't the resolution say nearly the same thing as it now does, but be phrased positively, as in, "The Council of the City of New York urges the Federal Communications Commission to implement proposed regulatory amendments that would allow portable and fixed devices to operate on the "white spaces" of the radio spectrum without causing harmful interference to television broadcasters and wireless microphones."

We should be excited about what this technology can do for our city, not afraid. Along with my written comments, I am also including a model resolution, which is much more positive. If you want New York City to be considered a leader in the nation on issues of technology, a visionary for the 21st century, I implore you to consider this alternate resolution.

The current draft resolution sends a message that this city is closed for business in the tech sector. It tells advocates like myself and others here today that, if we want to continue our work of trying to bridge the digital divide, we must do it with one wireless hand tied behind our back.

To repeat, the current draft resolution does not even mention the digital divide. 76% of low-income New Yorkers lack a high-speed Internet connection in their home, according to a recent study commissioned by the City's Economic Development Corporation. By bringing meaningful, cheaper Internet access to mobile phones, the opening up of white spaces would do more to impact that inequity than any other measure the government could take. Disparities in mobile phone use, even with data services like email or web, are much smaller than at-home Internet connections, in terms of class and race.

Mobile phones are far more widespread than computers with at-home Internet, especially among the groups currently marginalized from the Internet. According to the Pew Internet and American Life Project, "African Americans and English-speaking Hispanics are more likely than white Americans to use cell phones or PDAs for non-voice data applications." The situation is similar, if not quite as dramatic, for seniors and those with low incomes. Bring cheaper, faster Internet service to those mobile devices and the levels in access start to even out.

Unlicensed, low-power devices would make the most efficient use of our airwaves. After the Digital Television Transition in February, 20 percent of New York City's television channels will be vacant, according to a study conducted by Free Press. That's a lot of a really valuable resource to go unused. The other proposal for what to do with the white spaces is auction them off to big broadcasters. But those high-power signals require buffers that we just don't have in New York; that 20% is in lots of small pieces, not big chunks. So the licensed, high-power option would mean no new providers in NYC – zero. The only way for New York to benefit from white spaces is through unlicensed use.

Why does the resolution not mention the broad coalition of public interest organizations advocating for unlicensed use of the white spaces? Instead, it attributes the pressure for this policy change solely to "an alliance of large technology companies." Considering how organizations like mine have supported the efforts of this committee in the past, that omission is downright offensive.

Even though the resolution mentions many technology companies by name and separately says that Broadway provides "the equivalent of over 44,000 full time jobs," the resolution neglects to mention that software services alone provide over 94,000 jobs to the New York metro area, according to the Bureau of Labor Statistics. The entire tech industry is far larger. Opening up the white spaces would give a serious boost to this industry at a time when our city needs all of the economic help it can get.

Why does the resolution state that "testing by the FCC ... has consistently demonstrated that these devices do not accurately detect occupied channels, and therefore can interfere with wireless microphone transmissions," when in fact the "[white space devices (WSDs)] work perfectly at their intended design specifications," as Sascha Meinrath and Michael Calabrese of the New America Foundation explain?[1]

In the FCC tests, the devices successfully detected signals as weak as -114dbm, which was below even the -115dbm they were designed to detect and far, far below the -85dbm signal strength that a television needs to display an image. The Shure Microphone and National Association of Broadcaster disinformation refers to levels far lower than the standards the devices were originally required to meet. Saying that the device couldn't detect the signal is like me whispering your name from across the room and then accusing you of being hard of hearing when you don't look up. Keep in mind also that these were prototype devices, intended only to prove a concept, which they did. The certification rules will be stringent.

The resolution states, "If the FCC implements the regulatory changes under consideration, live theatre, the performing arts, film and television production companies will be unable to prevent constant interference with microphone systems, devastating those industries within the City of New York." This is a frightening, but entirely misleading scenario.

There is no one, anywhere that has advocated for certification of any device that would cause interference with television or wireless microphone signals. Trust me. I have a 9-year old sister in Brooklyn who would never forgive me if I did something to harm Broadway musicals. And mine is one of that dwindling class of households that gets television over the air – and I love watching TV. I promise that I would not advocate for anything that would damage either TV or Broadway.

So the argument here is not whether or not there should be interference, the only argument is whether or not the "spectrum sensing" technology will work to prevent interference. It will. Shure themselves advocated for spectrum sensing technology in a November 2004 filing with the FCC:

> "Shure proposes a three-part interference mitigation solution to protect the wide variety of important wireless microphone uses from harmful interference from unlicensed devices. Specifically, to mitigate potential interference the Commission should (1) identify 2 VHF TV channels and 4 UHF TV channels to be exempt from unlicensed device operations; (2) require unlicensed devices to employ spectrum sensing/dynamic frequency selection techniques in a distributed, cognitive fashion; and (3) implement a "smart" beacon system which would operate on one of the vacant TV channels being used by the wireless microphone system and transmit information concerning the TV channels in use by various wireless microphone systems."[2]

1"Unlicensed 'White Space Device' Operations on the TV Band and the Myth of Harmful Interference," Sascha D. Meinrath1 & Michael Calabrese= New America Foundation *Wireless Future Program,* March 2008.
2 "Comments of Shure Incorporated, In the Matter of Unlicensed Operation in the TV Broadcast Bands: ET Docket No. 04-186," November 30, 2004

Why do they oppose it now?

People's Production House, like all other WSD advocates, wants the FCC to establish rules for certifying devices that can peacefully coexist on the vacant TV channels. Everyone agrees that if the devices can't follow the rules, they shouldn't be certified. Simple enough. But if you want to pass a resolution to that effect, why frame it so negatively?

If you want to be negative, you should turn your attention to the wireless microphone manufacturers who, for years now, have deceptively marketed their products to Broadway productions, music venues, and houses of worship. Despite deceptive advertising by wireless microphone companies to the contrary, only film and television productions are authorized to use the systems. Wireless microphone manufacturers – including Shure, Nady, VocoPro, Audio2000, Sennheiser, Audix, Electro Voice, Hisonic International, and Pyle Audio – who have marketed their products to unauthorized users without informing them of the need for a license should be investigated and held accountable. I have notified the New York State Attorney General of these concerns.

That punishment should in no way apply to the Broadway League. I believe we need an amnesty for past, unauthorized users who were deceived and we need a new license class to permit them to operate legally from now on. Why doesn't the resolution adopt this position? Perhaps that what it means to urge the FCC "to refrain from implementing proposed regulatory amendments ... without ensuring that such amendments will not negatively impact ... all incumbent wireless microphone users." But that is a really twisted, negative way to make the statement. Why not urge the FCC to adopt measures to protect currently-unauthorized users of wireless microphone systems, while also closing the digital divide and boosting our economy?

We cannot ask the FCC to delay their consideration. Many of the wireless microphones are operating in the 700 Mghz band, which the Commission has already auctioned off to Verizon and others. Others of the TV channels where the microphones now operate will be dedicated to public safety. Wireless microphone users have to vacate these bands before the DTV transition or they will be the ones causing interference with proprietary mobile services and critical public safety communications.

The current draft resolution makes it seem like the wireless microphones can just stay where they are, but they cannot. They were squatting an abandoned building, which was fine, but Congress is now tearing down that building to give a luxury condo to Verizon and erect a new police precinct. There is a serious discussion going on right now at the FCC about where these microphone users should go. This resolution is not a productive contribution to that. I refer you to the comments submitted by the Public Interest Spectrum Coalition to the FCC in which they propose a new "General Wireless Microphone Service" as an appropriate solution.[3]

The worst part of the current draft resolution is that it suggests that we have to choose between wireless microphones and new devices to close the digital divide, when the new technology allows us to have both. If some group wanted to sacrifice low-income New Yorkers to preserve Broadway, I would oppose them, but I guess I would understand their position. But to sacrifice low-income New Yorkers for no reason at all, as this resolution does, is simply madness.

I urge you to vote against this resolution.

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3 "Petition To Create A General Wireless Microphone Service," Informal Complaint and Petition of The Public Interest Spectrum Coalition, July 16, 2008.

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Model Resolution
on
The Regulation and Use of the Unallocated Portion of the Radio Spectrum, Also Known as White Spaces

prepared by
People's Production House

Res. No. _____
Resolution urging the Federal Communications Commission to implement regulatory amendments that would allow portable devices to operate on the white space radio spectrum in order to close the digital divide and stimulate investment in new technology without negatively impacting television broadcasters, performing artists, professional sports leagues, and all incumbent wireless microphone users.

By Council Member

Whereas, The term "white spaces" refers to the unlicensed or unused portion of the radio spectrum found between television broadcast channels; and

Whereas, White spaces were assigned by the Federal Communications Commission ("FCC") in order to minimize interference between analog television broadcast channels; and

Whereas, after the digital television transition of February 2009, the need for such white spaces to avoid interference will be greatly diminished; and

Whereas, Millions of persons across the country and hundreds of thousands in the City of New York rely on over-the-air broadcast signals for their television reception; and

Whereas, a study commissioned by the New York City Economic Development

Corporation found that only 54 percent of moderate and high-income New Yorkers and only 26 percent of low-income New Yorkers have broadband access to the Internet; and

Whereas, the public hearings of the New York City Broadband Advisory Committee has shown a powerful need to connect more New Yorkers to the Internet at an affordable price; and

Whereas, Dozens of national industries, including live theatre, music productions, sporting events, film and television productions and houses of worship currently utilize wireless microphone systems that transmit in the television band over a short range; and

Whereas, only film and television productions are currently licensed to use these wireless microphone systems; and

Whereas, wireless microphone manufacturers have engaged in deliberate misinformation and deceptive advertising to persuade ineligible users such as houses of worship, theaters, corporate event venues, and members of the general public that they could legally purchase and operate wireless microphones operating on vacant broadcast UHF Channels without a license and for purposes prohibited by the Federal Communications Commission;

Whereas, continued illegal use of the television band will put valued local institutions and industries at risk; and

Whereas, continued illegal use of wireless microphone systems in the television band on channels 52-69 may cause harmful interference with public safety users authorized to broadcast in that band; and

Whereas, The performing arts, including Broadway and Off-Broadway productions, nonprofit theatres, orchestras, opera companies, dance companies and presenting organizations have utilized wireless microphones in countless performances

for more than three decades; and

Whereas, Wireless microphone systems permit the freedom of movement onstage, enhance backstage communication and contribute to the seamless operation of stage equipment; and

Whereas, The performing arts depend on wireless microphone systems in order to produce the high quality performances that contribute to the City of New York's rich and diverse cultural economy without jeopardizing the health and safety of performers, technicians and stagehands; and

Whereas, The use of wireless microphones by live theatre has evolved into a complex process, requiring technicians to adjust each show's wireless system prior to every performance in order to coordinate with nearby productions and to adjust for the City of New York constantly changing ambient signal traffic; and

Whereas, The incomparable mystique and excitement of the City of New York's theatre district has caused Broadway to develop into one of the City's top tourist attractions, annually responsible for over $5 billion dollars of spending into the local economy and supporting the equivalent of over 44,000 full time jobs; and

Whereas, An alliance of large technology companies, including Microsoft, Google, Dell, HP, Intel, Philips, Earthlink, and Samsung Electro-Mechanics, collectively known as the White Spaces Coalition, has proposed that the FCC should adopt regulatory changes that would allow the use of white spaces to deliver low-cost high-speed broadband internet to personal portable devices; and

Whereas, The technology sector is a vital contributor to New York's economy, supporting the equivalent of over 316,509 full time jobs, according to the Bureau of

Labor Statistics; and

Whereas, Prototype devices have demonstrated the feasibility of signal-sensing technology that will allow the use of white spaces without harmful interference to broadcasters; and

Whereas, A broad coalition of public interest groups, including People's Production House, Consumer Federation of America, Consumers Union, Free Press, Media Access Project, New America Foundation and Public Knowledge, primarily concerned with expanding high-speed access to the Internet have advocated for public access to the white spaces; and

Whereas, The Federal Communications Commission is prepared to rule on this issue in the upcoming months;

Resolved, That the Council of the City of New York urges the Federal Communications Commission to implement proposed regulatory amendments that would allow portable and fixed devices to operate on the "white spaces" of the radio spectrum without causing harmful interference to television broadcasters; and

Be it further resolved, That the Council of the City of New York urges the Federal Communications Commission to grant a general amnesty to all unauthorized users of wireless microphones systems; permit use of the illegal equipment on a going forward basis until the Commission establishes a new license class to enable future use of such systems in live theater, performing arts venues, and houses of worship; and establish a new "General Wireless Microphone Service" for this purpose.

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NYCwireless Testimony to the New York City Council
Regulation and Use of the Unallocated Portion of the Radio Spectrum, Also Known as White Spaces

Ladies and Gentlemen of the New York City Council and friends and guests, thank you for inviting me to speak. My name is Dana Spiegel, and I am the Executive Director of the non-profit NYCwireless, which builds free, public Wi-Fi hotspots in public spaces throughout New York City.

I come today not to talk about the FCC's plans or the facts about white space devices. I also will not speak about Broadway and Off-Broadway, which is an important cultural resource for this great city. Nor will I speak about the company Shure and other wireless microphone manufacturers, who have admitted to spreading false information about the impact of white space devices on existing equipment. Other presenters here today will speak extensively about these subjects.

I wish to speak solely about the value of such white space devices for all of New York City, and draw some parallels to a similar technology, Wi-Fi, and its history. I believe there are enough similarities between white space devices and Wi-Fi that we can draw some realistic conclusions about what might actually happen when white space spectrum becomes available.

Wi-Fi uses radio frequency spectrum covered under the FCC's Part 15, which allows companies to manufacture and sell certified devices that operate in the 2.4Ghz frequency range, and allows anyone to purchase such devices and operate them without applying for an FCC broadcast license. If you use Wi-Fi in your home, office or park, you are using a Part 15 device. The same goes for bluetooth headsets used with mobile phones, and baby monitors, garage door openers, and some cordless phones.

The precursor to 802.11 technology was invented in 1991, and since then has enjoyed tremendous success. You'd be hard pressed to find a computer user today who hasn't used Wi-Fi at some point. But it was never imagined to be such a ubiquitous or widely used technology. It was always originally expected that Wi-Fi devices would be used in large office buildings only, and consumer use was never considered.

In 2000, in New York and a few other cities like Boston and Seattle, technologists started to use the Wi-Fi devices to do the unimaginable: share the internet with their neighbors. NYCwireless was founded in 2001 with the pioneering purpose of using this technology to broadcast internet access to local neighborhoods. One of the first public hotspots in the world was in our own Tompkins Square Park.

Back then, devices were neither easy to use nor cheap to purchase for consumers. If you had a laptop, you could buy a Wi-Fi card and access point each for a few hundred dollars. But if you went to Tompkins Square Park or Bryant Park, you could do something that no one else in the world could do: sit under a tree and surf the internet.

Since 2000, New York City has seen dozens of parks lit up by NYCwireless and others, and each year more parks and public spaces are brought online. New York City was host to the first ever wireless arts festival, called Spectropolis, in 2003 and 2004, held in City Hall Park. NYCwireless and others have lit up dozens of affordable housing residences, providing residents the ability to get online and have a critically important lifeline. None of these achievements would have been possible without the FCC enabling the free, unlicensed use of the 2.4Ghz spectrum range.

But even more impressive than these achievements has been the explosion of Wi-Fi usage throughout New York City. Just about every business, both big and small, makes use of Wi-Fi. Cafés, restaurants, bars, and coffee shops offer Wi-Fi to their customers, and a significant percentage of the over 8 million residents in this city use Wi-Fi in their homes.

With all of these people using Wi-Fi and Bluetooth, you don't often hear about interference issues. Just about everyone makes use of Wi-Fi in their homes and businesses without issue. Bluetooth headsets work everywhere you walk. Baby monitors and cordless phones, devices that use the same tiny sliver of 2.4Ghz spectrum, work just fine too.

With all of its success, its surprising that Wi-Fi is in part utterly unlike the types of devices that the FCC is considering for use of white space frequencies. The biggest difference is that the proposed FCC rules for white space devices ensure they won't interfere with existing spectrum users, and that devices will contain technology to move around the white space spectrum to ensure that they never interfere. These tested devices have successfully proved that such technology is achievable, as have Bluetooth devices which contain similar intelligence.

In discussing this history of Wi-Fi, and highlighting its achievements, I hope to paint a picture for the Council about what white space devices may mean for New York City. Such devices have the possibility of enabling larger scale internet broadcast, providing inexpensive or free access to whole neighborhoods from the central anchor of a park. More buildings will be able to be retrofitted with internet access, a current challenge for a number of older NYCHA buildings. Schools and libraries will become internet hubs for their neighbors. In short, the amazing things we've done with Wi-Fi will be amplified with the availability of white space devices.

The FCC already has proposed white space device rules in place that ensure non-interference. Indeed, New York City, and Broadway (who makes use of Wi-Fi in their theaters to provide internet access to stage and production staff), stand to benefit enormously from white space devices, even while continuing to use their existing technology. Imagine if, instead of just using wireless microphones for audio, we could have videos of performances could be broadcast and entire neighborhoods could participate in such events.

Additional Reading

New America Foundation Wireless Future Program: http://www.newamerica.net/programs/wireless_future
Free Press, White Spaces: Bringing the Internet to Everyone: http://www.freepress.net/whitespaces
GigaOm: http://gigaom.com/2008/09/24/the-devil-is-in-the-details-in-white-space-debate/ and
http://gigaom.com/2008/07/21/will-the-fcc-play-lollapalooza/
People's Production House: http://www.peoplesproductionhouse.org/dei/endorsewhitespaces

Testimony of Chris Keeley
Associate Director of Common Cause/New York

Before the New York City Council
Committee on Technology in Government
regarding Res 1613-2008, "Refrain from implementing
proposed regulatory amendments that would allow
portable devices to operate on the white space radio spectrum."

September 29, 2008

New York City Council

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Good morning. My name is Chris Keeley and I am the Associate Director of Common Cause/New York. Common Cause/NY is a non-partisan, non-profit citizens' lobby and a leading force in the battle for honest and accountable government. In the past three decades, by fighting together we have enacted real change and will continue to do so in New York and nationally. Common Cause fights to strengthen public participation and faith in our institutions of self-government and to ensure that government and political processes serve the general interest, rather than special interests.

Right now, we are working on several fronts, including working to increase the diversity of voices and ownership in media, to make media more responsive to the needs of citizens in a democracy and to protect the editorial independence of public broadcasting. For decades we have fought to increase access to government and government transparency.

The proposal before us today offers a valuable opportunity to consider a major development in telecommunications, namely the burgeoning availability of so-called "white spaces." These are the spaces between current television channels and they will become available in early 2009 when television broadcasts will be provided digitally.

Common Cause believes that white spaces hold great potential for increased democratic participation and greater access to government. The Federal Communications Commission proposes that these spaces remain available for public use. Common Cause, here in New York and nationally, supports this proposal.

In recent years, the internet has provided far greater access by citizens to their government. Whether it is through the posting of legislation or regulatory proposals online, web-streaming of committee meetings, or the availability of government forms for download, the internet has brought access to the government decision-making process and its services right to the fingertips of citizens with an internet connection.

White spaces have the potential to unlock a wave of technological innovation that can bring more citizens high-speed internet access. Engineers, designers and developers would have great incentive to develop new products, thereby facilitating a drastic increase in internet connectivity both here in New York City and throughout the State. Instead of having locally-installed broadband access or limited-strength municipal wireless networks, the powerful white space frequencies would unleash the internet connectivity at far greater speeds and easily surmount many physical and economic barriers.

Common Cause expects that continued technological innovation will bring more citizens (and non-citizens) into the technological age and help to bridge the technology gap.

Many agencies in New York State are already harnessing the power of the internet through web-casting and the posting of valuable documents and resources. With broader access and faster speeds, however, the white spaces would provide the concerned citizens throughout the

state right into the decision-making process, regardless of economic, physical or geographic barriers. We expect to be at the forefront in New York City and State in the fight for additional government disclosures being provided online, such as advanced notice of public meetings and web-streaming of these same proceedings. Freeing the white spaces would broaden any of these benefits by leaps and bounds.

Unleashing the white spaces is good for the democratic process in New York, and good for the citizens of New York.

In recent years, New York City, the members of this Committee, and its Chair, in particular, have drafted and supported forward-thinking proposals to bring the people of New York into the legislative process and decision-making process by harnessing the power of the internet. City agency information is made available for the public to review, and that is largely a credit to the members of this committee. The FCC's proposal would give the valuable efforts of this Committee and Council a powerful shot in the arm by allowing this additional information to be harnessed by countless additional internet users.

Common Cause strongly supports New York's cultural institutions and members of its entertainment industry. We understand the concerns cited in Res. 1613 regarding this industry. We, like the sponsors of this resolution, do not believe that the twin goals of protecting New York's entertainment industry and freeing the white spaces are incompatible. However, we are concerned that the resolution, in its current form, will encourage those who simply oppose opening up the white spaces to broader public use.

We believe that the Council is in a unique position to urge the FCC to take the necessary regulatory steps to insure that *both* the broader public interest and the concerns of the entertainment professions in New York City are served by the FCC's proposed regulation.

We urge the Committee to revise Res. 1613 to more strongly support the underlying goal of unleashing the power of the white spaces and facilitating broader access to our city, state and federal government. If there exists technological "fixes" to the problems the Resolution raises, such as inexpensive beacon devices or a number of less technologically-reliant possibilities (asking patrons to turn off their cell phones at the theatre, for example), we urge the Council's modified resolution to specifically reference it.

Thank you once again for this opportunity to testify here today, and I look forward to working with the Council on this and other critical issues in the future.

ACTORS' EQUITY ASSOCIATION 1913

TESTIMONY

THE NEW YORK CITY COUNCIL COMMITTEE ON TECHNOLOGY IN GOVERNMENT

MONDAY, SEPTEMBER 29, 2008

Submitted by
Ira Mont
Third Vice President
Actors' Equity Association

Good morning Chairwoman Brewer and members of the Technology in Government Committee. Thank you for holding this hearing on the regulation and use of the unallocated portion of the radio spectrum known as "white spaces." My name is Ira Mont and I am the Third Vice President of Actors' Equity Association, which represents more than 47,000 professional stage actors and stage managers nationwide.

I am also the Production Stage Manager of the MEL BROOKS' YOUNG FRANKENSTEIN, giving me first hand experience on the use of wireless microphones that operate on these white spaces. For the last several decades, the theatrical community has relied on the use of wireless microphones, allowing communications backstage that are indispensable to the integrity of the show, and more importantly to the safety of the actors and dozens of industry professionals who work backstage. In addition wireless mikes are used by the actors so that the audio heard by the audience is clear and distinct.

Because of the limited space and the highly technical aspect of each production, the choreography backstage is often more intricate than what is onstage. During each performance of YOUNG FRANKENSTEIN, I and my stage management team call several hundred cues. These cues are for lighting, turntables, scenery that flies in or moves on stage, trap doors opening and closing, smoke and fog, to name just a few. These cues also alert the actors to their entrances, whether it's to walk onto the stage or to fly in on apparatus from above the stage.

The wireless microphone systems are a highly complex process and require frequent recalibration to the show's system before every performance in order to avoid interference with the many other uses of the white space spectrum, including our neighboring shows. Without these systems, theatrical venues – from Broadway to small developing theaters to large arenas –

across the country will simply not be able to operate and the results will likely be damaging for both the venues and the communities in which they are located. These theaters, like Broadway, are often an important economic engine for these cities and towns. And just like Broadway, these theaters help to support dozens of ancillary businesses, returning hard-earned dollars into the communities.

Technological advances have allowed theatrical productions to become more inventive, incorporating elements of spectacle and wonder into the performances. However, these lavish Broadway musicals, which audiences across the nation have come to expect and enjoy, could be changed forever if the FCC allows white spaces to be used for devices that deliver high-speed broadband internet to personal portable devises. FCC testing has consistently shown these devices do not accurately detect occupied channels and could interfere with the wireless microphone systems used in theatrical venues.

Actors' Equity Association applauds the New York City Council's Committee on Technology in Government for its proposed resolution in which the Council urges the FCC to refrain from implementing the proposed regulatory amendments without ensuring such amendments will not have a negative impact on all incumbent wireless users. Without proof the portable devices will not interfere with the white space usage, and strongly worded protective amendments, the proposed regulatory amendments could devastate live theater as we know it.

Thank you.

Written Testimony of
Theatre Communications Group
Submitted September 29, 2008 to
The New York City Council
On the Importance of White Spaces and
Protecting Performing Arts Technology

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Dear Honorable Speaker Quinn and Members of the entire City Council. Thank you for holding this Hearing on the White Spaces, for providing leadership in trying to protect the performing arts here in New York City, and for allowing me to appear before you to provide public testimony.

Theatre Communications Group is a Founding Member of the Performing Arts Alliance, formerly called the American Arts Alliance. The Performing Arts Alliance members include the Association of Performing Arts Presenters, Dance/USA, League of American Orchestras, OPERA America, Theatre Communications Group, Chorus America and the National Alliance for Musical Theatre. I am here to testify on behalf of the entire Performing Arts Alliance and all of our members.

I am here to stress the importance of maintaining interference-free and affordable use of wireless microphone and related audio equipment currently being used by communities, performers, and audiences.

The Performing Arts Alliance is a national network of more than 4,000 members comprising the professional, nonprofit performing arts and presenting fields. For 30 years, the Performing Arts Alliance has been the premiere advocate for America's professional nonprofit arts organizations, artists and their publics before the U.S. Congress and key policy makers. Through legislative and grassroots action, the Performing Arts Alliance advocates for national policies that recognize, enhance and foster the contributions made by the performing arts to America.

Professional wireless sound equipment is used to provide high-quality audio to our audiences, and to record and present these artistic performances to people all over the world through broadcast on television, cable, satellite and the Internet. Wireless microphones and related wireless audio equipment are used extensively and play a critical role in the production of dance, music, opera, orchestra, and theatre performances. Audiences would not hear the performers without wireless microphones and the recording of such productions provide an infinite opportunity to expand the audience and availability of these performances to individuals who are unable to attend live performances. Many performances require as many as 45 frequencies for each production.

Wireless microphones and equipment are utilized to facilitate communication between backstage staff members and performers. Directors, managers, crew members and many others rely upon such equipment to communicate performance and lighting cues, staging movement and other vital directions. The use of wired audio equipment would not only be impractical, but would create an unsafe and dangerous work area for performers and staff. Wireless microphones and audio equipment provide the freedom to move safely and quickly through the stage environment while providing high-quality and reliable audio transmissions. There is no practical or feasible alternative to the wireless audio systems currently used by performing arts organizations. Without them the performing arts would be silent.

We applaud the City Council's Resolution, urging the FCC to refrain from implementing proposed regulatory amendments that would allow portable devices to operate on the 'white space' radio spectrum without ensuring that such amendments will not negatively impact the performing arts and all incumbent wireless microphone users. We have asked the Commission to craft rules which would require that new portable devices, intended to operate in this spectrum, not be permitted until they are tested and verified that they will not disrupt wireless equipment. We have further requested that the Commission designate certain "clean" spectrum that can be used by our audio systems without the threat of interference from the new devices and to adopt appropriate protections. Without the high-quality and interference-free operation of wireless microphones, the audio quality of performing arts performances and recordings would be greatly diminished, impairing thousands of productions and reducing the availability and opportunity for millions of Americans to enjoy these art forms.

The performing arts sector is hopeful that whatever the technical solution, that it prevents interference and also acknowledges the sector's legitimate and continuing use within the spectrum. Performing arts organizations have used wireless technology in our performance spaces for at least 30 years. We have never fit into

any of the license categories, and so we currently operate unlicensed. Yet, the technology has long existed that allows our members to present high quality performances, that millions of audience members across the country have come to expect, and certainly deserve. It seems that the FCC simply hasn't caught up with the performing arts in terms of acknowledging optimal conditions for arts organizations to serve the public.

Over the past year, there have been two informal 'white space' demonstrations held in New York, and organized by The Broadway League. Each demonstration was attended by an FCC Commissioner, who witnessed the kind of interference that could happen if new devices, and the policies regulating those devices, do not contain adequate safeguards. Further, the FCC held its final 'white space' official field test at the Majestic Theatre here in New York. We believe that, because they have visited performing arts venues in New York City and have held a final test here, that the FCC Commissioners recognize the importance of the performing arts to New York and the country, and that they are interested in a solution that serves all parties.

In addition, the nonprofit performing arts sector cannot shoulder the financial burden of a transition alone. Our members operate under tight financial constraints and the purchase or upgrade of new equipment, all at once, would be impossible, even for our larger members.

The Performing Arts Alliance respectfully asks the City Council to communicate to the FCC the importance of ensuring that any changes in the use of the broadcast spectrum will not disrupt dance, music, opera, orchestra, and theatre performances enjoyed by millions of Americans. Absent tested and proven interference protection measures, especially the operation of personal/portable devices within a performance space, could wreak havoc with wireless microphone systems and audio equipment. Not only would this disrupt the audience's enjoyment of the performance and impair the recording and broadcast of the performance, but it would also hinder the ability of stage crews to communicate effectively and the artists to perform safely. The FCC should continue its careful testing and craft policies that will ensure that change in the use of the broadcast spectrum will not interfere with the wireless microphone and audio equipment that is essential to bringing live performances to millions.

Thank you.

Testimony of Mary Landolfi, President, American Federation of Musicians, Local 802

Prepared for

The New York City Council

Committee on Technology in Government

"The Regulation and Use of the Unallocated Portion of the Radio Spectrum" (a.k.a. White Spaces)

10 AM September 29, 2008

Committee Room, City Hall

New York City

Good morning. Before I begin, I would like to thank the Chair, Councilwoman Brewer and all members of the Committee on Technology in Government for the opportunity to present testimony at this hearing.

My name is Mary Landolfi and I am the president of the American Federation of Musicians, Local 802. I am here to address the serious issue of the FCC's testing of mobile Internet devices designed to operate in what is known as "white spaces"—the frequencies between television channels. We at Local 802 and our parent organization, the American Federation of Musicians believe this to be a very risky proposal that will have devastating effects on live concerts, Broadway productions, symphonic performances and any event where wireless microphones are used. These Internet devices will operate on frequencies close to, or even on top of, those used by wireless microphones. This will create a very high chance of interference, thereby ruining the audience's experience.

The economic effect of any reduction of audience enjoyment of live performance is potentially devastating. Broadway alone contributed over $5 billion to New York City's economy during the 2006-2007 season. The sound engineers on each production work with broadcasters and others who use the "white spaces" for wireless microphones to ensure that all users operate on separate frequencies. The success of these vital steps requires, among other things, sufficient space between the frequencies in order to guarantee no interference. Permitting the use of "white space" devices, before it is irrefutably proven they can reliably detect when frequencies are occupied and that they will not interfere with incumbent wireless microphones, puts Broadway's economic contribution to the NY economy at risk.

Thus far, the Internet "white space" devices tested by the FCC have failed to reliably detect when "white space" frequencies are in use. Without reliable detection, these new devices will interfere with other incumbent microphones or broadcasters. Allowing untested, mobile Internet devices to operate in the

television "white space" frequencies, which will be used by non-professionals (i.e., consumers) who cannot be expected to coordinate frequencies with other users, will almost guarantee interference with other incumbent wireless microphone users and broadcasters.

In some markets, the "white spaces" often do not even exist. In New York City, Los Angeles, Las Vegas, Nashville and other cities with a large entertainment and cultural market, the so-called "white spaces" are being used by wireless microphones. In other words, there is no space for these new devices to operate.

"Beaconing" technology, which "white space" device proponents claim is a suitable solution to the interference problem, has yet to be tested and has never been made public by the manufacturers. We have no idea if this technology is possible or if it will work correctly. Furthermore, a great deal of professional concert halls and theaters are non-profit organizations that may not be able to afford the "beaconing" technology (even if it does help with the interference problems). It should not be incumbent upon them to purchase this new technology when the FCC, for the last 35 years, has allowed professional theaters to operate on the television "white spaces" without a problem.

For the record, the American Federation of Musicians is not opposed to new, mobile Internet devices operating in the "white spaces." We understand the benefit they might offer to the public. However, just as a responsible automobile manufacturer doesn't release a new car into the market until it has been rigorously tested in both lab and real world settings, we call on the FCC to prohibit the production, sale or use of these devices until it has done the same. The FCC must establish beyond all doubt, in the lab and in the real world that these products will in no way jeopardize New York's audience experiences, or pose any risk to our economy by interfering with incumbent wireless microphone use.

THE BROADWAY LEAGUE

226 West 47th Street New York, NY 10036

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SEPTEMBER 29, 2008
Hearing of the City Council's Committee on Technology in Government,
Chaired by Council Member Gale A. Brewer:

- Oversight - The Regulation and Use of the Unallocated Portion of the Radio Spectrum, Also Known as White Space.

- Resolution 1613 urging the Federal Communications Commission to refrain from implementing proposed regulatory amendments that would allow portable devices to operate on the white space radio spectrum without ensuring that such amendments will not negatively impact television broadcasters, performing artists, professional sports leagues, and all incumbent wireless microphone users.

TESTIMONY OF THE BROADWAY LEAGUE

THE BROADWAY LEAGUE

226 West 47th Street New York, NY 10036
www.BroadwayLeague.com

Good morning. I am Heidi Mathis, the Corporate Relations Manager for the Shubert Organization, here on behalf of The Broadway League, the national trade association of the commercial Broadway industry with over 600 members throughout North America. As you undoubtedly know, issues the FCC is deciding today will directly affect the future of Broadway and all live theatre, so we thank Council Member Brewer and the other distinguished members of this Committee for the opportunity to share our thoughts and concerns with you.

There is no other assembly of theatres in the world as well respected for the quality of its productions as the Broadway community. Each year, we host millions of tourists coming to New York from all over the world to experience Broadway and see the lights of Times Square, which translates into millions spent on hotels, taxis, gifts, restaurants and all other types of secondary spending. Broadway is essential to our economy; we are responsible for infusing New York City with over $5 billion dollars a year and creating the equivalent of nearly 45,000 jobs in the metropolitan area. As you may recall, the City's Comptroller estimated a $38 million loss in local tax revenue during last year's 19 day stagehand strike, while other published reports suggested that overall spending in the City was down $17 million per day during that period.

Each year, Touring Broadway visits nearly 250 North American cities, bringing the opportunity to experience the live shows only Broadway can deliver to countless theatre fans who may never get the chance to visit New York. Our most recent studies estimate that, including ancillary spending, touring performances contribute to over $3 billion dollars of spending nationwide each year. Approximately 12% of that money returns to New York, but the bulk of the spending supports the economies of the cities presenting Touring Broadway.

No industry, more so than live theatre, utilizes and relies on wireless microphone technology in its daily operations. We have devoted the past three decades to building on the dynamic staging and vibrant performances afforded by the freedom of wireless microphones. Everyone is aware that actors wear wireless devices to run, dance and sing without the need for a cumbersome microphone wire. But few realize that wireless systems are integral behind the scenes. Musicians, technicians, stagehands, stage managers – in fact, nearly every show participant uses a wireless device, and all of motorized stage equipment is operated wirelessly. Each night, productions like the Lion King, Wicked and Spamalot use up to 70 unique wireless channels to bring to life the performances that audiences expect and deserve.

Managing Broadway's wireless operations is enormously complicated, and our wireless systems may be gravely threatened by the introduction of proposed hand-held devices which would transmit on the bandwidth we occupy, but at a much high-power. With direct line of site, a typical wireless signal on Broadway will carry only 125 - 150 feet. Add obstructions like performers, patrons, set pieces and walls -- many reinforced with steel to contain wireless waves – and a wireless signal may not carry more than 80 feet. In addition, our sound engineers constantly coordinate with other productions and scan the area for available bandwidth to reduce the possibility interference from local broadcasters. These new devices could effectively over-power our signals and cause our transmitters to cut out mid-performance.

Because we operate at extremely low power, unlike TV broadcasters, our productions do not fall within the FCC's category of licensed users. However, all of our wireless equipment is certified by the FCC as having been manufactured in accordance with Federal broadcast guidelines and we do not operate on frequencies the FCC has cleared for public safety. Prior to a show's opening, our highly skilled technicians spend weeks coordinating frequencies with other theatres and local televisions broadcasters to ensure interference is never an issue. In all the years Broadway and Touring Broadway have been operating, the FCC does not have a record of a single complaint filed by a television or radio station about interference from a Broadway show.

In an effort to safeguard white space users from interference from new devices, the FCC asked manufacturers to submit proposed spectrum sensing devices for review --devices designed to refrain from transmitting when in close proximity to another wireless source. The FCC scheduled tests all over the country and under a variety of circumstances. For the final test, FCC engineers spent two days at Broadway's Majestic Theatre, taking readings in and around the theatre before and during a performance of Phantom. Despite some published hyperbole to the contrary, neither of the two tested devices adequately detected operating microphones at any testing phase. One device, presented by a Singapore based firm called I2R, consistently missed active wireless channels, while a device offered by Philips showed false positives time and time again. An industry like Broadway, which relies on clear, reliable wireless transmissions, cannot support introduction of new white space devices with these results. In real-world terms: a new device activated on 6th Avenue may not detect a signal emanating from a nearby Broadway theatre and decide it's safe to transmit, but once activated, the new device's signal will interfere with that Broadway theatre's wireless system and affect the show's sound quality.

We've heard new device proponents use terms such as "enhanced spectrum sensing," "beaconing," and a "belts and suspenders approach," which simply piles unproven technology on top of unproven technology, to hide significant technical flaws in the devices and inherent limitations of the white space frequencies. One channel simply cannot be occupied by two transmitters, and available white space is already limited. Unfortunately, no hi-tech terminology can skirt these constraints. Then we must consider the question of who would bear the burdens of purchasing any new equipment current users may be asked to obtain to help support the introduction of new devices.

Again, I we thank you for this opportunity. The Broadway League is happy to work with the City Council, the FCC and the members of the White Space Coalition towards developing a reasonable, workable solution to this complex problem. However, we do not believe new devices should be considered for the marketplace until technology permits national use of the white space without interference to current users. Therefore, we support Resolution 1613 and we ask the Committee to vote yes.

FOR THE RECORD

Comments of Michael P. Lebow, Chief Technology Officer, DoITT
Before the City Council Committee on Technology in Government,
Hearing on Regulation and Use of Unallocated Portions of Radio Spectrum
(September 29th, 2008)

Good morning, Chairwoman Brewer and members of the Technology in Government Committee. My name is Michael P. Lebow and I currently serve as Chief Technology Officer of the City's Department of Information, Technology and Telecommunications. On behalf of the administration, it is my pleasure to comment on a matter of great importance to several industries and community-based organizations throughout the city.

On February 17th, 2009 the Federal Communications Commission (FCC) will celebrate the first milestone in its decades-long effort to overhaul the nation's wireless frequency spectrum. By that date, all television broadcasters must have abandoned analog broadcast frequencies and completed the transition to digital broadcast services. This Congressional mandate, a product of the Digital Transition and Public Safety Act of 2005, effectively reopened a large part of the spectrum for new uses and provided the FCC with an opportunity to reorganize the way many parts of the spectrum are utilized and regulated. Several concurrent initiatives, such as the redistribution of parts of the 700 MHz spectrum for public safety communications, are also underway as an added result of this Act.

Some of the most recent proposals for reallocation of the frequency spectrum focus on space at the lower end of the old analog TV spectrum, generally somewhere between 510 and 698 MHz, where bands of unused buffer spectrum, known as "white spaces", are evenly distributed between functioning blocks. For decades, licensed spectrum users such as radio and analog television broadcasters have coexisted with low-power, localized users in nearly every community across the country. These low-power users can be broadly categorized as localized operators and include organizations and industries which have a singular, supporting need for wireless audio applications. Examples include Broadway theatres and performing art centers throughout our city, where wireless audio systems are vital communication tools that allow performers and backstage crew members to choreograph all aspects of work. Similar, low-power audio links can be found in sports stadiums, houses of worship and community centers.

Although the country's frequency spectrum is regulated by a tightly-woven series of rules and regulations, these standards have historically served the dynamic, high-power requirements of commercial broadcasters, service providers and public safety agencies as well as the diverse, and modest, needs of local users. But, today, the low-power citizens of the electromagnetic spectrum community are at risk of becoming casualties of an economic agenda which favors the support of corporate interests over the practical needs of community-based activities and industries.

A powerful new alliance of advanced technology providers, known as the White Spaces Coalition, has proposed changes to the uses of these whitespaces. The membership list of this organization includes such large corporations as Dell, Google, Hewlett-Packard, Microsoft and Philips Electronics. And they all share a common interest in opening up new markets by offering wireless broadband services and other high-end technology applications. The only problem is that their solutions are contingent

on reallocation and licensing of white space frequencies. They recognize that electromagnetic spectrum is not something that can be seen or touched, but it is no less valuable – and is, in fact, often more valuable – than other naturally occurring resources.

For months, the FCC and members of the White Spaces Coalition have defended reallocation of the white spaces based on technological harmonization of its uses. Their theory, which has only recently been subjected to testing, is that frequency-sensing equipment available on advanced wireless devices will be able to sense the presence of both high- and low-power systems already occupying space on the spectrum. In a perfect world, frequency-sensing technology would quickly and accurately detect open frequencies and enable wireless broadband users to access them, thereby enabling old and new applications to coexist.

But the tests conducted by the FCC over the summer – including some right here in New York City's Broadway theatre district and Time Square – have produced unsatisfactory results. Early reports suggest current frequency-sensing technology is slow and inaccurate, essentially negating any hope of finding a short term technical solution to the problem of interference. The aggregate effect of the FCC's agenda has thus been to move unlicensed, low-power users to smaller and smaller sections of free white spaces that are in lower, and less appealing, blocks of the available frequency spectrum.

The dilemma we face today is thus a simple one: should we support the overexpansion of advanced wireless applications or find a balanced solution that affords each group the ability to coexist? The frequency spectrum is, unfortunately, a finite resource, and the collocation of licensed and unlicensed users in the white spaces would almost certainly create interference problems in cities and towns across the country. Faced with the very real threat of interference or the costs of acquiring licensed spectrum for their needs, the only option left might be for them to abandon current networks altogether. As a consequence, the collateral damage – the impact to operational abilities – could be even more extensive than the costs of compliance:

- Patrons of the performing arts could be forced to watch their favorite actors, dancers and support staff move around the great stages of the city while trailing bulky lengths of cables and wires. These virtual umbilical cords would be needed to connect their ear pieces and microphones to the advanced audio systems deployed in nearly every major venue today.
- Security personnel in large residential and office buildings would not be able to communicate with each other on localized wireless networks. Instead, they would turn to traditional landlines spread throughout large buildings to report public safety and operational problems while on patrol.
- Other community-based organizations, such as churches, temples, mosques, senior centers, sport teams and meeting halls might abandon audio systems entirely, while professional sports teams such as the Mets and Yankees would be forced to procure expensive, labor-intensive professional wireless audio systems to communicate within their own stadiums.

Even the nation's largest New Year's Eve celebration is threatened by the white spaces controversy. Each year, Time Square is host to an exceptional array of performances in the hours leading up to the countdown to New Years Day. The collective entertainment program includes hundreds of people who – like Broadway performers – choreograph complex productions in part by using localized wireless audio systems. It

may be surprising, but the pre-eminent celebration of New Year's Eve in the country, one celebrated by two million people in person, and tens of millions around the world, could not exist in its current form without both licensed and unlicensed uses of the wireless spectrum.

In closing, I would remind you that we still have time to find a common solution. There is no limit on further testing of wireless-sensing technology and no deadline that must be kept for reallocation of these white spaces. Although we believe the rights of low-power, unlicensed users must be protected, the best possible outcome is one which allows both legacy and next-generation services to coexist.

Testimony of Motorola, Inc. to New York City Council - September 29, 2008

- Thank you for inviting Motorola to participate in today's Council hearing to address TV Whitespace and focus on protecting the communications requirements of Broadway theatre, one of New York's most important businesses. Motorola has developed technology that will allow TV stations, wireless microphones and TV Whitespace devices to co-exist in the spectrum without interference.

- Motorola is in the midst of celebrating 80 years of innovation in communications. These innovations include the first public safety radio in a police car over 70 years ago, the portable cell phone, while most others were still thinking of cellular as only a mobile in-car service, and the system that supported communications when the U.S. landed on the moon.

- A new innovation on the horizon is cognitive radio technology, that is, technology that is smart enough to find the vacant gaps in the radio spectrum and operate on those gaps without interfering with current operations such as the wireless microphones used by Broadway.

- All wireless communications require the foundation of radio spectrum to operate. The TV band includes 300 MHz of spectrum which is 6000 times the spectrum used for each channel on which your police, fire departments and transit systems communicate. There are gaps in that 300 MHz where the spectrum is not used for TV broadcast. Some of those gaps are used today in very confined areas like Broadway theatres, houses of worship, and concert venues for wireless microphones. However, many of those spectrum gaps still go unused.

- Motorola has developed technology that can access these gaps while protecting TV broadcast and wireless microphone use. The technology is called "geolocation." The basic approach is that before selecting a TV channel on which to operate, our TVWS devices would access the information in a database of which channels are used and which are vacant in a given area. Information on TV stations is already in the FCC's database. In addition, we have been discussing this issue with wireless microphone experts and they have agreed that one of the best ways to protect wireless microphone use is to designate some channels in the data base in each market for wireless microphone use, on which TVWS devices would not operate. Further, if additional wireless microphone channels are needed beyond those designated on a nationwide basis, supplemental channels could be entered in the database for protection in a given area, e.g., Broadway.

- Motorola believes this is a practical way to protect important operations currently in the band, and at the same time open the unused TVWS spectrum to help bring broadband to all Americans across the country, help make our industries more competitive and use the limited spectrum resources more effectively. We are working with the FCC to implement rules that meet all of these important goals.

- I would be happy to answer any questions.

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September 29, 2008

The Regulation and Use of the Unallocated Portion of the Radio Spectrum, Also Known as White Spaces
Written Testimony of Shure Incorporated
New York City Committee on Technology in Government

Thank you Chairperson Brewer and Members of the Committee for inviting Shure Incorporated to participate in today's important hearing. Shure is an American company founded in 1925 that has served society with a wide variety of audio products known for their performance and reliability. Today, Shure is the worldwide leading manufacturer of wireless microphones. Therefore, we have been active participants in the Federal Communications Commission's rulemaking process regarding potential new products and services that would use the "white spaces" of the television spectrum, which has been the operating territory for the majority of wireless microphones since the 1970s.

The panel of experts assembled by this Council is impressive, and we are particularly pleased that you will receive testimony from the Broadway League. The League has been a thought leader for New York City's interests at the FCC and in Congress on the white spaces issue. Therefore, it is appropriate that you have the opportunity to hear from them directly. Broadway contributes significantly to this city's cultural and economic well-being, and the amount of wireless audio used throughout each and every performance on Broadway is dramatic.

As bright as the "lights on Broadway" are, however, Shure believes it is equally important for the Council to keep in mind the multitude of other wireless microphone uses in the city. Radio City Music Hall, The Ed Sullivan Theater, Madison Square Garden, Rockefeller Center, The Javitz Center, and Yankee and Shea Stadiums (both old and new) are top of mind. The diversity of events—from ballgames to political conventions, from corporate seminars to news broadcasts—is tied together by a common production infrastructure in which wireless microphones (not to mention in-ear monitors and behind the scenes intercoms) are deployed by the thousands on the stages, sets, streets, studios, and sidelines of New York.

These are major venues with huge demands for wireless audio infrastructure. In turn, these New York icons provide an important cultural and economic benefit for the city, the state, and the entire region.

These world renowned venues, however, are just a fraction of those potentially impacted by the FCC's white spaces decision. In fact, it is the smaller venues, night clubs, college sports broadcasts, churches, hotels, and off-Broadway and nonprofit theaters that will feel an even bigger pinch from an ill-advised FCC decision, due to budget constraints in an increasingly challenging economic environment.

If the new white spaces devices have the potential for the debilitating interference to wireless microphones that was demonstrated during the FCC's recent field tests at the Majestic Theater, tens of thousands of wireless microphones deployed on a daily basis in New York City would quickly turn from completely reliable to randomly functional. The high population density of New York already makes coordination of wireless audio extremely challenging. In fact, Times Square has been described by audio professionals as the most difficult spectrum environment in the world. Introducing personal wireless devices that operate in the same spectrum to the general public is, in the minds of these professionals, a formula for disaster.

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The city's institutions can't afford to simply discard their audio technology investments—and FCC policy shouldn't require them to—when there is no available substitute for these high-quality professional products.

The FCC is being pressured by white space device advocates to make its decision before President Bush leaves office and the new President appoints his own Commissioners. We think that to force an arbitrary, political deadline on such an important technical decision does a disservice to the many legitimate stakeholders in this debate in New York City and in other major news and entertainment markets like Chicago, Los Angeles, Las Vegas, Nashville, and many others.

The original primary goal of the white spaces proceeding was to deliver broadband Internet access to underserved rural areas of the country—and the pro audio industry wholeheartedly supports this—but now we face a very different dynamic with much more severe consequences for our country's urban centers of commerce and culture.

The FCC has proposals before it that we believe make sense and attempt to forge a reasoned solution. Simply put, Shure is encouraging the Commission to reserve sufficient spectrum for wireless microphone use that meets everyday needs but is scalable to accommodate large events. We also encourage further research on interference mitigation technologies that will inevitably be required as an increasing population of wireless products is deployed throughout the nation in the future, but we do not endorse blind faith that these technologies are ready for mass production without thorough demonstration of their capabilities in the laboratory and in the field.

Today, however, particularly for cities like New York, where the "white spaces" are really "dark grey" spaces, we believe there must be a clear priority for wireless microphone operation before white space devices may send any transmission signals. We're hopeful that advocates for new devices will see the value of this approach in order to move forward with innovation without moving backward on communications, arts, and culture.

FCC filings from two of the outstanding Members of Congress from New York, Representatives Maloney and Nadler, remind all of us that no city—no region—will feel the impact of interference from white space devices on wireless microphones and audio systems more than New York. The cultural and economic risks are significant and real, and the entire production community employed in this city is gravely concerned about the outcome.

There simply is no second chance for a live performance.

On behalf of Shure Incorporated's Chairman, Rose L. Shure, our Senior Management, and all of our Associates worldwide, please accept our appreciation for inviting the Company's testimony on this critical policy issue. It is our hope that the Council swiftly adopts the pending resolution.

Mark Brunner
Senior Director, Public and Industry Relations

MAXIMUM SERVICE TELEVISION

Testimony of
David L. Donovan
President,
Association for Maximum Service Television, Inc.
Before the
Council of the City of New York
September 29, 2008

In re
The Regulation and Use of Unallocated Portion of Radio Spectrum, Also Known as White Spaces

Good morning. My name is David Donovan and I am president of the Association for Maximum Service Television, Inc. (MSTV). Since 1956 MSTV has been the leading engineering trade association for the television broadcast industry. For the past decade MSTV has been a leader in the development of digital broadcast television technology.

Working with the FCC, we helped create the current DTV channel system, which resulted in channels 52-69 (nearly one-third of all broadcast channels) being returned to the government. These returned channels will be used by public safety and auctioned for advanced wireless systems, such as WiFi and WiMax. Indeed Google originally placed a bid to operate on some of these channels, but withdrew its offer.

These channels are ***not*** the subject of this current dispute. The current dispute centers on the remaining TV channels 2-51. In New York, broadcast television stations use these channels. They are shared with land mobile, public safety, and health care monitoring systems. In addition, wireless microphones used to cover live local news, sports as wells as TV and film production share these frequencies. Broadway also share these frequencies. Most importantly, all of these uses are subject to a high degree of professional engineering coordination to avoid interference.

Contrary to some Whitespace advocates, there is *no* significant amount of unused spectrum in New York. These advocates fail to consider a multitude of existing alternate uses, as well as interference that will occur to consumers' television reception. My testimony focuses on two major problems: 1) interference to television viewing and 2) the ability to use wireless microphones to cover live news, sports as well as TV program production.

At the outset, New York consumers are in the process of a highly complex digital transition. Nationwide, industry and government are spending billions of dollars educating consumers about the transition, which will occur on February 17, 2009. Unfortunately, we are discovering that the manifestation of interference in digital is more pronounced that with analog. Interference to analog may cause some sparkles or wavy lines. However, interference in the digital world causes the picture to lock and freeze. Even the smallest amounts of interference can make a digital picture unwatchable.

Importantly, interference does not occur at the broadcast tower or at the facilities on the Empire State Building – it will occur in living rooms and kitchens throughout New York. The key issue is the signal that is being received by your antenna. .

Imagine you are on the beach and standing next to a lighthouse. The light is blinding. If you move a mile down the beach, the light from the lighthouse becomes a pin dot. If one stands 10 meters away with a flashlight, your eye will see more light from a flashlight than from the lighthouse. This analogy applies to radio frequencies as well. The key factor is the proximity of the unlicensed device to the antenna on the back of a consumer's television set. If you have a set of rabbit ears on your TV set, the interference will occur at the TV set. For consumers living in an apartment or condominium with a master antenna system, the antenna on the roof will receive the interference and affect all viewers connected to that system.

There are two types of interference. The first occurs when these devices turn on the same channels consumers are trying to watch. This is called co-channel interference. For example, after the transition CBS will actually broadcast from channel 33. If one of these devices turns on to channel 33, it will interfere with consumer reception of that station for kilometers, affecting tens of thousands of viewers.

A second type of interference occurs when unlicensed devices operate on channels that are immediately adjacent to channels consumers are trying to watch. This is called adjacent channel interference. Using the same example, interference will occur if

unlicensed devices operate on channels 32 and 34. Many digital television sets are unable to block out or "reject" signals operating in close proximity on these adjacent channels. This type of interference can vary from 10 to 100 meters, depending on the strength of the broadcast signal and the power of the unlicensed device. When calculating the number of vacant channels in New York and elsewhere, Whitepace advocates incorrectly assume you can operate on these first adjacent channels. This assumption is simply incorrect. Operating on these channels will cause interference to reception.

Whitespace advocates acknowledge interference is an issue; the only question is whether they have an effective way to protect consumers. Some advocate "sensing" where the unlicensed device attempts to "sense" whether there is an operating TV channels or wireless microphone. This has occupied the FCC's attention for the past several years.

The FCC conducted laboratory and limited field tests. These tests demonstrate that "sensing alone" will ***not*** protect consumers' television viewing. Based on our observations of the FCC field tests, the four devices tested had a sensing error rate ranging between 27 to 37 percent. Despite attempts to spin this differently, sensing devices have proven to be unreliable, and will not protect TV viewers from interference.

Device	Total Errors /Scans	% Error Rate
Motorola (Detects DTV channels only)	**195/724**	**26.9%**
Philips	**353/1302**	**27.1%**
Adaptrum (2 hr. scan time)	**204/682**	**30%**
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Similar sensing problems arose with respect to sensing wireless microphones. The devices tested at Fed Ex field in Washington and at the Majestic Theater in New York failed to adequately sense operational wireless microphones.

The impact on New Yorker viewers will be devastating. First, there will be significant interruptions in over-the-air television service. Consumers living in high density areas, like New York are highly susceptible to interference. The unlicensed devices causing interference may be located in the next apartment or in the next building.

Because the devices are unlicensed, there will be no way trace the interference or remedy the problem.

Minority and low-income populations are harmed significantly, because of their disproportionate reliance on off-air television broadcasting. The major Spanish language broadcast networks, including Univision, Entravision, and Telemundo expressed this concern to the FCC. HTTP, a leading Hispanic communications policy organization has also expressed concerns.

Access to interference-free over-the-air digital television is critical during emergencies. During 9/11 more than a million New York citizens lost all video television because a cable hub was located under the world trade center. For some time, the CBS broadcasts from the Empire State Building were the only video images for these citizens. Over-the-air television is critically important for government communications to citizens. During emergencies, local television and local television news crews serve as the "First Informers" of vital information.

Interference will not be limited to over-the-air viewing. FCC field tests indicate that unlicensed devices will cause "direct pick up" interference to digital cable ready sets. The National Cable and Telecommunications Association has urged the FCC to impose very strict power limits, 10 milliwatts, to any unlicensed device place in the TV band.

Second, interference to wireless microphones undermines live local news and sports coverage. As the recent tests confirmed, problems with sensing makes these microphones highly susceptible to interference from unlicensed devices.

If millions of unlicensed devices enter the market, it will be impossible to prevent interference during live interviews. Consumers operating these devices during sporting events will prevent live game coverage. In addition, it will also interfere with "in-game" communication systems such as coach cams used during NFL games. For theses reasons Major League Baseball, the NFL, the NHL, the NBA, the PGA Tour, NASCAR, and ESPN have all opposed allowing these unlicensed devices to operate in the TV band.

Whitespace advocates suggest that users can perhaps use "beacons" to prevent interference. The FCC has not tested these devices. These so-called "beacons" would attempt to prevent unlicensed devices from operating on the same frequencies that were being used for wireless microphones. Beacons are not a viable solution. First, if an unlicensed device is unable to sense a TV signal or a wireless microphone signal, it is unlikely to sense the beacon on a consistent basis. Second, because it uses the same spectrum that could be used for additional wireless microphones, a beacon is an inefficient use of spectrum. This becomes critically important during emergencies or national events when all available frequencies are used for wireless microphones. For example, nearly 24 TV channels were used for wireless microphones during the recent Democratic National Convention in Denver. It takes engineers weeks to coordinate these events. Similar coordination is necessary for sporting events at the Meadowlands,

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It must be emphasized these devices will be unlicensed. The FCC will have no licensee to correct any interference problems. Manufacturing standards will be difficult to administer. Moreover, we are not dealing with relatively short-range unlicensed devices such as garage door openers. Proponents contemplate placing millions of devices on TV frequencies. All based on failed tests. Once interfering devices enter the market, there is no way to recall them. The damage from interference will be irreparable.

As the largest media market in the United States, New York has a unique interest in the FCC's proceeding. Its population density will make its citizens highly susceptible to interference from unlicensed devices. Broadway, which generates billions of dollars to the New York economy, requires interference-free wireless microphones. Its sports teams require interference-free microphones. Finally engineering the frequencies needed for daily newscasts will be impossible if unlicensed devices, relying exclusively on sensing, are placed in the TV band. Because of its unique status, we urge the City Council to make its concerns known to the federal communications commission.

MAXIMUM SERVICE TELEVISION

Testimony of
David L. Donovan
President,
Association for Maximum Service Television, Inc.
Before the
Council of the City of New York
September 29, 2008

In re
The Regulation and Use of Unallocated Portion of Radio Spectrum, Also Known as White Spaces

Good morning. My name is David Donovan and I am president of the Association for Maximum Service Television, Inc. (MSTV). Since 1956 MSTV has been the leading engineering trade association for the television broadcast industry. For the past decade MSTV has been a leader in the development of digital broadcast television technology.

Working with the FCC, we helped create the current DTV channel system, which resulted in channels 52-69 (nearly one-third of all broadcast channels) being returned to the government. These returned channels will be used by public safety and auctioned for advanced wireless systems, such as WiFi and WiMax. Indeed Google originally placed a bid to operate on some of these channels, but withdrew its offer.

These channels are ***not*** the subject of this current dispute. The current dispute centers on the remaining TV channels 2-51. In New York, broadcast television stations use these channels. They are shared with land mobile, public safety, and health care monitoring systems. In addition, wireless microphones used to cover live local news, sports as wells as TV and film production share these frequencies. Broadway also share these frequencies. Most importantly, all of these uses are subject to a high degree of professional engineering coordination to avoid interference.

Contrary to some Whitespace advocates, there is *no* significant amount of unused spectrum in New York. These advocates fail to consider a multitude of existing alternate uses, as well as interference that will occur to consumers' television reception. My testimony focuses on two major problems: 1) interference to television viewing and 2) the ability to use wireless microphones to cover live news, sports as well as TV program production.

At the outset, New York consumers are in the process of a highly complex digital transition. Nationwide, industry and government are spending billions of dollars educating consumers about the transition, which will occur on February 17, 2009. Unfortunately, we are discovering that the manifestation of interference in digital is more pronounced that with analog. Interference to analog may cause some sparkles or wavy lines. However, interference in the digital world causes the picture to lock and freeze. Even the smallest amounts of interference can make a digital picture unwatchable.

Importantly, interference does not occur at the broadcast tower or at the facilities on the Empire State Building – it will occur in living rooms and kitchens throughout New York. The key issue is the signal that is being received by your antenna. .

Imagine you are on the beach and standing next to a lighthouse. The light is blinding. If you move a mile down the beach, the light from the lighthouse becomes a pin dot. If one stands 10 meters away with a flashlight, your eye will see more light from a flashlight than from the lighthouse. This analogy applies to radio frequencies as well. The key factor is the proximity of the unlicensed device to the antenna on the back of a consumer's television set. If you have a set of rabbit ears on your TV set, the interference will occur at the TV set. For consumers living in an apartment or condominium with a master antenna system, the antenna on the roof will receive the interference and affect all viewers connected to that system.

There are two types of interference. The first occurs when these devices turn on the same channels consumers are trying to watch. This is called co-channel interference. For example, after the transition CBS will actually broadcast from channel 33. If one of these devices turns on to channel 33, it will interfere with consumer reception of that station for kilometers, affecting tens of thousands of viewers.

A second type of interference occurs when unlicensed devices operate on channels that are immediately adjacent to channels consumers are trying to watch. This is called adjacent channel interference. Using the same example, interference will occur if

unlicensed devices operate on channels 32 and 34. Many digital television sets are unable to block out or "reject" signals operating in close proximity on these adjacent channels. This type of interference can vary from 10 to 100 meters, depending on the strength of the broadcast signal and the power of the unlicensed device. When calculating the number of vacant channels in New York and elsewhere, Whitepace advocates incorrectly assume you can operate on these first adjacent channels. This assumption is simply incorrect. Operating on these channels will cause interference to reception.

Whitespace advocates acknowledge interference is an issue; the only question is whether they have an effective way to protect consumers. Some advocate "sensing" where the unlicensed device attempts to "sense" whether there is an operating TV channels or wireless microphone. This has occupied the FCC's attention for the past several years.

The FCC conducted laboratory and limited field tests. These tests demonstrate that "sensing alone" will ***not*** protect consumers' television viewing. Based on our observations of the FCC field tests, the four devices tested had a sensing error rate ranging between 27 to 37 percent. Despite attempts to spin this differently, sensing devices have proven to be unreliable, and will not protect TV viewers from interference.

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Second, interference to wireless microphones undermines live local news and sports coverage. As the recent tests confirmed, problems with sensing makes these microphones highly susceptible to interference from unlicensed devices.

If millions of unlicensed devices enter the market, it will be impossible to prevent interference during live interviews. Consumers operating these devices during sporting events will prevent live game coverage. In addition, it will also interfere with "in-game" communication systems such as coach cams used during NFL games. For theses reasons Major League Baseball, the NFL, the NHL, the NBA, the PGA Tour, NASCAR, and ESPN have all opposed allowing these unlicensed devices to operate in the TV band.

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Comments of Thomas J. Hillgardner
on behalf of the
Association of Cable Access Producers
in opposition to Resolution 1613

My name is Thomas J. Hillgardner and thank you for hearing me today. I am speaking on behalf of the Association of Cable Access Producers (ACAP) and also all activists interested in more open access to the Internet and a greater variety of media sources. We are calling on the City Council to reject Resolution 1613 as unnecessary.

ACAP, which initially started as an advocacy group whose focus was limited to public access television, is adapting to the changing environment for independent media. One of those changes is the adoption of digital broadcasting technology and the efficiencies it permits in the use of radio spectrum. While it was necessary many years ago for the FCC to set aside spectrum to prevent radio interference between competing broadcasters, this dedicated spectrum, known as "white space" is no longer necessary to insure that the signals of incumbent broadcasters are free of radio interference.

Recently, the FCC has sought comment on how best to use this excess spectrum. Unfortunately, incumbent broadcasters, cell phone companies, and the makers of certain wireless devices perceive "white space" as harmfully competitive to their interests. They are concerned that opening white space will constitute a lowering of the barriers for entry into the field of broadcasting in the nature of an opportunity for the people to obtain low-cost, high-speed Internet access thereby creating an opportunity for people to become voices in the electronic marketplace of ideas.

The current legislation being considered appears to be a misguided effort by the City Council, responding at the behest of narrow interests, to prevent the opening of this spectrum for general use by the public. It simply is not true that opening the spectrum will pose a danger to television broadcasters, performing artists, professional sports leagues, and all incumbent wireless microphone users in the sense that the users of the white space spectrum might interfere with these users' signals. The FCC already has tested many devices and determined that the opening of the white spaces will not have an adverse affect on these incumbent users. What these narrow interests really want to stop is competition in the electronic communications marketplace. However, that is precisely what is needed and what will most benefit the poorest of New York's citizens.

The City Council can provide lip service to the notion of bridging the digital divide until the cows come home or it can do something about it. Making white space available for public use is one of the most positive things the City Council can do to help bridge the digital divide. It will provide opportunities for immigrants to make low cost international telephone calls using technology such as Skype and the only persons who might be against this are incumbent wireless communications companies who would be losing that business. But at the end of the day these wireless communications companies are not the people you were elected to serve. You were elected to serve the people of the City of New York who, as a whole, will benefit tremendously from the opening up of white space for public use. Indeed, with the coming economic downturn, now is not the time to avert our eyes from ways to make high-speed Internet access cheaper and more readily available. It is time that our poorest citizens are no longer relegated to no access or only dial-up access.

CAROLYN B. MALONEY
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TESTIMONY OF CONGRESSWOMAN CAROLYN B. MALONEY
The New York City Council Committee on Technology in Government
Hearing on the Regulation and Use of the Unallocated Portion of the
Radio Spectrum, also know as White Spaces
September 29, 2008

Thank you for giving me the opportunity to offer testimony to express my strong reservations regarding the possibility that the Federal Communications Commission (FCC) will permit unlicensed operation in the TV broadcast bands, commonly referred to as "white spaces"based on the very circumspect results derived from the Commission's laboratory and field testing earlier this year. The FCC's tests, one of which was conducted right here in the Broadway district at the Majestic Theatre, demonstrated that these new devices are very likely to cause debilitating interference to wireless microphones -- especially in urban environments like New York. The impact could have serious repercussions on live theater in New York – a multi-billion dollar industry that employs tens of thousands of people.

Technology that is not ready for prime time could interfere with pre-existing devices used by industries as large as Broadway Theaters and as small as churches and community centers. To give you an idea of just how congested Manhattan's white space is, forty Broadway theaters put on daily performances using up to 200 different frequencies for their microphones in each venue, and television studios, such as MTV, ABC, and others share crowded airwaves using a good neighbor policy. Interference in these airwaves from new devices could have a disastrous effect on Broadway, which contributes nearly $5 billion in the New York City economy and 44,000 full-time jobs to New York City residents.

On May 17, 2007, along with a number of New York Congressional colleagues, I wrote to Chairman of the FCC, Kevin J. Martin. In that letter we pointed out that, for a multi-billion dollar industry like Broadway, even the smallest amount of interference to their wireless microphone system could prove disastrous. We pointed out that the unreliable devices could adversely impact the staging of Broadway shows and interfere with the quality of sound heard by every theater-goer and the technology used to bring the Broadway experience to hearing-impaired individuals.

On July 29, 2008, I sent another letter to the FCC Chairman. In that letter, I echoed concerns voiced by the Broadway League that "should the FCC's testing [of proposed portable white space devices] continue to demonstrate that spectrum sensing devices cannot protect

[wireless microphones], any application for national use of portable equipment must be rejected."

So far, reports on FCC testing of the new white space devices, performed in its own labs and in the field, have not proven that these devices can reliably detect the presence of a wireless microphone or a TV signal. Therefore, until incumbent stakeholders, including the Broadway League, can be guaranteed that their wireless microphone transmissions will be protected from interference, I think we must encourage the manufacturers to redouble their engineering commitment and submit new prototypes for FCC review.

Diverse groups such as the National Association of Broadcasters (NAB), National Religious Broadcasters, churches across the nation, NFL, NASCAR, Grand Ole Opry, Country Music Association, Broadway, Cirque du Soleil, and the MGM Grand have expressed serious concern. Just last week an independent news organization reported that one of the prototypes tested "often found channels occupied even whenever they were unlikely to be. ... The other [prototype] ... often failed to detect wireless microphones."

Last week was a really interesting time to be serving in Congress, let me assure you of that much. But aside from the horrible economic mess we're tackling, proponents of these new devices held a pep rally on Capitol Hill intended, in their words, to encourage the FCC to approve white space devices this year before the presidential election. I have to ask myself why they set this seemingly arbitrary deadline? I don't believe that this issue is so time sensitive that we should look the other way so the Bush folks can make another long-term policy decision -- one that potentially devastates Broadway productions -- that can't be undone. It makes much more sense, in my opinion, to let the next Administration settle in, appoint its own FCC commissioners, and revisit the issue at that time. President Bush has done quite enough already, and the issue of white spaces is better left for either Senator Obama or Senator McCain.

In conclusion, I want to emphasize that I support innovation and encourage the efficient use of public airwaves, but not at the expense of existing wireless microphone systems that provide an important public good. If the FCC can reserve and protect the existing wireless microphone spectrum, leaving other ranges available for new technologies, then the FCC would create a balance that will allow the introduction of exciting new electronic devices and increased access to the Internet, while, at the same time, protecting existing industries and local churches and community centers. We cannot afford the risk that premature devices will play havoc with essential equipment used by a multi-billion dollar New York City industry. I encourage the City Council to make a strong statement in support of Broadway and wireless microphone use throughout the City.

Thank you for your attention to this matter.