

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
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Amendment of Part 90 of the Commission’s ) WP Docket No. 07-100  
Rules )  
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**COMMENTS OF THE CITY OF NEW YORK**

The City of New York (“the City”) respectfully submits these Comments in response to the Sixth Further Notice of Proposed Rulemaking (“6FNPRM”) – WT Docket No. 07-100. The City appreciates this opportunity to express its opinion on this important issue, which affects the City’s public safety communications infrastructure.

**I. INTRODUCTION**

The 4940 – 4990 MHz (4.9 GHz) band is 50 MHz of spectrum allocated for fixed and mobile services and designated for public safety use. The City of New York is an intense user of the 4.9GHz spectrum. Public safety agencies within the City hold numerous licenses for this spectrum, including a geographic license, licenses for fixed operations, and licenses for mobile operation. The New York City Police Department (“NYPD”) alone holds 58 such licenses. In June 2012, the Commission issued a Fifth Further Notice of Proposed Rulemaking (“5FNPRM”). In December 2013, the City filed Reply Comments in response to the Public Safety and Homeland Security Bureau’s public notice and the 4.9GHz band-plan proposed by the National Public Safety Telecommunications Council (NPSTC). Many of the City’s positions expressed in that filing are expanded upon and reiterated herein.

## **II. Public Safety Use of the 4.9 GHz Band in New York City**

Public Safety entities within the City of New York use the 4.9GHz band extensively to support a variety of fixed and mobile applications. The following is a brief description of some of these applications.

- The New York City Police Department (“NYPD”) utilizes the 4.9GHz band to support on-street camera video backhaul, specialized video link applications supporting bomb squad robots and counter terrorism applications.
- The New York City Fire Department (“FDNY”) utilizes the 4.9GHz band to support wireless video and data communications at the scene of major fires, including wireless Command Boards which track all resources, both human and material, at the scene of an incident enabling Incident Commanders to more readily and efficiently conduct fire operations.
- New York City Transit (“NYCT”) utilizes 4.9 GHz channels to support their Help Point emergency call box system deployed in the underground sections of the NYC subway system. This system provides subway passengers with a means to call for assistance if an emergency should arise while they are on the subway platform.
- The Port Authority of New York and New Jersey utilizes 4.9 GHz channels for video transport both within and in the vicinity of the three major airports that serve the New York Metropolitan Area. Port Authority Police Officers have the ability to monitor video streams from fixed camera locations around the airport perimeter and at other strategic locations from a central fixed location or a mobile unit.
- The New York City Department of Information, Technology and Telecommunications (“DOITT”) uses 4.9 GHz fixed point to point links to connect radio sites throughout the City.

- The New York City Office of the Chief Medical Examiner (“OCME”) uses 4.9 GHz to support itinerant operations at the scene of Major Casualty Incidents (“MCIs”).

The Region 8 Regional Planning Committee (RPC) oversees the assignment of 4.9GHz channels within the New York metropolitan area to ensure non-interference and addresses interference issues that arise on the 4.9 GHz band.

### **III. The Nature of the 4.9GHz. Band Lends Itself to Local Control**

The propagation characteristics of the 4.9GHz band should be exploited to allow for maximum band-plan flexibility. Although limited range reduces coverage, which is a disadvantage, this characteristic can also be used as an advantage. The advantage of such limited range is the ability to control the transmitted signal much more granularly than signals in the lower bands. Proper engineering, coupled with RPC application review and oversight, can enable 4.9 GHz band segments (“channels”) to be re-used at close intervals without interference. The Commission’s proposed band-plan approach, which in part ties specific applications to specific channels on a nationwide basis, is at odds with the very nature of the 4.9 GHz radio channel.

In high frequency bands, such as the 4.9 GHz band, locally developed band-plans that consider local radio propagation conditions and the requirements of local public safety entities are a far more appropriate mechanism to provide concurrent user isolation than a nationwide band-plan which restricts local public safety wireless initiatives and strands spectrum segments. One of the Commission’s stated goals is to maximize the use of the 4.9 GHz band. However, the Commission’s proposed nationwide band-plan, which in part ties specific applications to designated channels, undermines this goal as described below.

#### **IV. Isolation**

The mobile radio channel is best envisioned as a three dimensional object defined by frequency, time and space. This model is particularly useful in designing high frequency broadband networks or other interference limited radio networks.

Isolation between users can be achieved by altering frequency (channels), time (slots), space (three dimensional geography) or power. When rules are created that only consider alterations to frequency to achieve isolation, the result is an inefficient use of spectrum. Establishing a band-plan for the 4.9GHz. public safety band and applying it nationwide without considering alternative means to achieve isolation will result in spectrum inefficiency.

The Commission's proposed nationwide band-plan for the public safety 4.9GHz broadband spectrum allocation is misguided. Assigning specific channels to specific applications on a nationwide basis strands spectrum segments, effectively rendering them unusable in many jurisdictions. Furthermore, depending solely on channel separation to provide the required isolation between concurrent users is spectrally inefficient.

Vertical separation is a low cost technically effective means to provide isolation between concurrent radio users on the same channel. It is particularly effective in high frequency bands such as 4.9GHz. The Commission's proposal to impose a nationwide band-plan that considers isolation only through frequency domain methods, and ignores isolation techniques that operate in the time domain or the spatial domain, does not promote maximum spectrum re-use.

The following example illustrates the potential frequency re-use of the 4.9GHz band simply by adding vertical separation as an available engineering tool. The Commission should consider the following scenario which takes into account local radio propagation conditions in NYC.

- A 4.9GHz channel is used in the underground sections of the subway system to support an emergency call box system.

- The same channel is used at the street level to provide backhaul for security cameras monitoring the street.
- The same channel is used to provide fixed point to point connectivity between rooftops greater than 200ft. above street level.
- All three applications are active at the same time, on the same channel, at the same “XY” coordinate location.
- The result is a spectrally efficient use of the 4.9 GHz band in a dense urban environment.

The Commission should consider that properly engineered systems employing vertical separation, directional antennas and alternative polarization that exploit natural and man-made barriers can provide sufficient isolation between concurrent users on the same channel. The Commission should allow RPCs with a detailed knowledge of local radio propagation conditions and public safety agency requirements the flexibility to develop local band-plans that differ from the nationwide band-plan and are not application specific.

## **V. Stranded Spectrum Segments Reduce Spectrum Utilization**

The Commission’s proposal to aggregate channels one through five and assign this aggregated channel for air mobile or robotic use while prohibiting alternative uses is misguided, as it restricts the use of this spectrum segment to specific applications on a nationwide basis. New York City has no objections to the use of channels one through five for air mobile operations in other jurisdictions. However, as NYC does not use this band for this purpose, we object to the prohibition of using channel one through five for alternative applications. As previously stated, we strongly believe that such a restriction would create a stranded spectrum segment not only in NYC but in any jurisdiction that did not use these channels for the specified applications.

The City of New York does not use the 4.9GHz band for air mobile use. Rather, it uses the Television Broadcast Auxiliary Service band (6225 – 6525MHz.<sup>1</sup>) which is shared with electronic

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<sup>1</sup> See FCC Radio Station Authorization, Call Sign WRAX853

news gathering helicopters. Within this band there are 12 available channels that are assigned by a local frequency coordinator on a daily basis. These 12 channels are sufficient to accommodate existing air mobile video demands in the New York metropolitan area. We recognize that some locales desire to use 4.9GHz for air mobile use due to local terrain issues and we have no objection to them doing so.

### **Band-plan**

The Commission established RPCs to allow for local control and flexibility. Establishing nationwide rules that do not consider unique local propagation conditions, and the requirements of local public safety entities, is counterproductive, does not promote spectrum efficiency and does not utilize the RPCs to their best advantage.

NYC believes that each region is unique in geography, terrain and the proliferation and density of man-made structures, all of which shape the 4.9 GHz signal contour and can be used to provide coverage or isolation. NYC also recognizes that user requirements and applications differ between Regions. NYC urges the Commission to develop a nationwide band-plan that permits applications on specific channels but does not prohibit these channels from alternative uses in Regions where that application is not a requirement for local public safety entities.

Specifically, NYC suggests that any RPC be allowed to develop its own 4.9 GHz band-plan and submit it to the Commission for approval. Once approved, the local RPC band-plan would supplant the nationwide band plan in that Region. If a Region failed to submit a 4.9 GHz band-plan within a prescribed time period, the nationwide band-plan would prevail. If at a later date a Region developed a 4.9 GHz band-plan it would be afforded an opportunity to submit it to the Commission for approval.

Issues arising between Regions that adapted disparate band-plans would be resolved through the RPC concurrence process already in place. If an application presented to a RPC crossed Region boundaries, concurrence would be required from the affected Region(s). Itinerant mobile operators would be required to adhere to the band-plan in effect in the Region where they are operating.

Fixed license applicants would be required to present engineering data to demonstrate that their signals would not cross Region borders. Alternatively, fixed license applications that are designed to cross Region borders would require concurrence from the Region(s) that their signal traversed. The use of vertical separation, directional antennas, alternative polarization, power control and channel separation are engineering design tools that can be employed to minimize any potential conflicts. The limited propagation characteristics of the 4.9 GHz band further minimizes the likelihood of cross regional interference.

NYC believes that the 4.9 GHz. nationwide band-plan should allow channels 1 through 5 to be aggregated and designated for air mobile and robotic use, but that the nationwide band-plan should not prohibit other public safety uses of channels 1 through 5 in Regions or jurisdictions where air mobile and robotic use of the spectrum is not employed or contemplated.

The City concurs with the Commission's proposal and the Association of Public Safety Communications Officials ("APCO")<sup>2</sup> that the maximum allowable channel aggregation should be increased from 20MHz to 40MHz. Generally, in broadband networks, access to larger spectrum slices increases spectrum efficiency. The City further suggests that in certain cases it is advisable to permit the entire 50MHz band to be aggregated as a single channel. The example below illustrates one such case.

- The City of Port Angeles Washington has deployed a 4.9GHz broadband network<sup>3</sup> which uses all 50 MHz of the 4.9GHz public safety allocation<sup>4</sup>. Under the proposed rule changes outlined in the Sixth FNPRM, the Port Angeles network would not be affected as it would be protected by the "grandfather" clause provided that it certified that they actually use all the channels in the 4.9 GHz band. However, jurisdictions seeking to deploy a similar network in the future would be precluded from doing so since the maximum proposed

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<sup>2</sup> See APCO Report at 13. Relaxing the 20 megahertz aggregation to permit a 40 MHz channel "should be possible with proper frequency coordination and would be quite useful especially in rural areas that have little or no use of the band. This would support public safety needs for cameras and data intensive applications that require more bandwidth."

<sup>3</sup> See Supplemental Network Description - Port Angeles Citywide 4.9 GHz Public Safety Broadband Wireless, available at: <https://ecfsapi.fcc.gov/file/7022022196.pdf>

<sup>4</sup> See FCC Station Authorization WQOC993, available at: <http://wireless2.fcc.gov/UlsApp/UlsSearch/license.jsp?licKey=3311512>

channel aggregation would be 40MHz. An additional impediment to deploying a future similar network is that, as per the Commission’s proposed band-plan, channels 1 through 5 would be reserved exclusively for air mobile or robotic applications.

The above example underscores the need for local control and the desirability of allowing RPCs to establish local band-plans.

## **VI. Spectrum Leasing**

As stated above, New York City public safety agencies are heavy users of the 4.9GHz band. As such, the City is concerned that if the Commission were to authorize sharing of the 4.9GHz. band with utilities and or commercial entities through leasing arrangements, existing public safety deployments could be negatively impacted resulting in degraded performance. Specifically, the City is concerned that broadband wireless networks sharing the band utilizing LTE protocols in close proximity to existing NYC public safety agency deployments will result in a throughput degradation to the incumbent public safety system. The City suggests that if leasing arrangements are authorized, exclusion zones be created to ensure that such degradation does not occur and that in all events, public safety entities must have the ability for “immediate interruption.”

## **VII. Conclusions and Recommendations**

New York City is heavily reliant on the 4.9GHz band for mission-critical communications and has a substantial investment in the current infrastructure. As such, the City concurs with the 6FNPRM recommendation that existing licensees be “grandfathered” and not be required to modify their 4.9 GHz systems.

The City concurs with the Commission’s proposal, and APCO’s recommendation that the nationwide band-plan allow for a maximum channel aggregation of 40MHz. In addition, the City urges the Commission to allow for channels 1 through 5 to be aggregated for air mobile or robotic use, but not to prohibit other uses in regions where these applications are not used.



The City urges the Commission to consider that the limited propagation characteristics of the 4.9GHz band coupled with local terrain and manmade structure impediments, shape the 4.9GHz signal contour, providing design engineers with an opportunity to manage both coverage and isolation more granularly than in lower bands. The City contends that these factors favor a local rather than a nationwide band-plan. The City urges the Commission to authorize RPCs to develop their own 4.9GHz band-plans, which if approved by the Commission, would supplant the nationwide band-plan for that Region.

The Commission should consider authorizing 4.9GHz geographic licensees to enter into spectrum lease agreements with Critical Infrastructure Industries (CII) or commercial entities to fund the construction of local 4.9GHz network that serve both public safety and the CII or commercial entity, while providing priority access to public safety users. Alternatively, the Commission should authorize 4.9 GHz geographic licensees to enter into lease agreements with CII or commercial entities and utilize revenue generated by such a lease agreement to invest in public safety communications projects within their jurisdiction

Respectfully Submitted,

The City of New York

July 5, 2018