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

In the Matter of	)	
	)	
Service Rules for the 698-746, 747-762 and 777-792 MHz Bands	)	WT Docket No. 06-150
	)	
	)	
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band	)	PS Docket No. 06-229
	)	
	)	
Amendment of Part 90 of the Commission's Rules	)	WP Docket No. 07-100
	)	

COMMENTS AND
PETITION FOR RECONSIDERATION

I. Introduction and Summary

I am filing these comments to the FCC's Third Report Order and Fourth Further Notice of Proposed Rulemaking published on January 25, 2011. I am an Industry Consultant and have been working with the Public Safety community on the development of the Nationwide Interoperable Public Safety Broadband Network for the past three years. My services have been provided to the Public Safety community on a *pro-bono* basis. I am Vice-Chairman of the APCO Broadband Committee and the Nationwide Sheriff's Association (NSA) representative to the ERIC Public Safety Advisory Committee.[1]

It is my belief that this FNPRM was introduced by the FCC prematurely, and that it contains items that should be the purview of different types of organizations. While it does contain items that should be mandated by the FCC, it also contains many items that should

[1] ERIC PSAC Appointment document

remain the purview of the various standards bodies engaged with the standards for LTE. Further, many of the items discussed in this FNPRM should be the purview of a Nationwide Network Governance Entity (NNGE).

My recommendation to the FCC is to cancel or withdraw this FNPRM until such time as the NNGE has been formed and has had an opportunity to address the operational issues involved with developing a nationwide strategy for the construction and operation of the network and has made operational decisions concerning the types of features and functions to be included in the network on a nationwide basis, which items will be within the control of the local Public Safety entities making use of the network, and how issues such as roaming across the Public Safety network as well as onto commercial networks have been addressed.

After this has been accomplished, it would then be appropriate for the FCC to re-introduce the NFPRM, which would be complementary to the work performed by the NNGE and that will remain the purview of the various standards bodies.

In reality, the FCC should mandate only those items that will be minimally required to ensure full interoperability, and the Public Safety network should be treated exactly the same as the commercial networks that are being developed on the 700-MHz band. However, the balance of this filing will list in more detail the items included in the NFPRM that I believe should and should not be mandated by the FCC, and I will identity the appropriate groups (standards bodies or NNGE) that should be responsible for items included in the NFPRM that should not be included in a revised or reintroduced notice.

II. The Role of the Nationwide Network Governing Entity

The construction and operation of the Nationwide Interoperable 700-MHz Public Safety Network will involve a complex set of tasks. Public Safety networks typically have requirements that are different from commercial networks. Thus it is important that the Public Safety community be able to make use of a common air-interface standard (LTE) and to design the network and its operation so these construction and operational requirements are met. At the same time, they should be within the feature and function sets established by the standards bodies, including the 3GPP. Further, the NNGE will need to discuss network architecture,

features, and functions with the commercial network operators that are or will be building similar networks either on a nationwide basis or within their local service areas.

It is of utmost importance that the NNGE not be controlled by the FCC. However, the FCC should work in close conjunction with the NNGE to support the NNGE's efforts and to provide rulemaking that is complementary but does not hinder the work of the NNGE.

The NNGE should be a funded organization with the ability to hire qualified RF and system engineers, business and accounting professionals, and/or sub-contract firms as needed that will be responsible for implementing the construction and interoperability decisions of the NNGE. The make-up of the NNGE is under discussion with others who are working with Public Safety to determine the proper mix of representation. However, it is important that the Public Safety community be treated as *THE* customer of the NNGE and that the NNGE be responsive with the features and functions Public Safety requires and needs.

The NNGE should be able to balance network requirements and operational features and functions with the development of the commercial LTE networks, with the work being performed by the standards bodies, both on release 8 of the LTE standard and future releases. It should work with the FCC and ERIC to ensure that the common goal of a nationwide, fully-interoperable network is achieved in the shortest amount of time and at the minimum possible expense.

The NNGE should be responsible for working with commercial network operators that are willing to work in public/private partnerships to provide services that will assist Public Safety in the construction and operation of this network, and for meeting the mission-critical criteria mandated by the NNGE.

It is of utmost importance that the NNGE be in place and fully operational prior to any further rulemaking by the FCC in this matter. It is also essential, as detailed below, that any such rulemaking should be limited to items that will not materially change over the life of the network. Precluded in any rulemaking should be items that are operational in nature and that have been and will be developed by the standards bodies working on LTE future releases as well as work already begun on the definition of the next generation or 5G network standards.

Likewise, it is imperative that the FCC rulemaking not hamper or cripple the NNGE but rather be complementary to it.

The Public Safety broadband network, as well as commercial LTE networks on the 700-MHz spectrum, will be evolving over time and NNGE must have the flexibility to review and implement future releases of the LTE standard, work in conjunction with commercial operators and equipment vendors in order to determine which features and functions suit the needs of the Public Safety community, and when and how they should be implemented. It is not possible with an evolving standard for the FCC to mandate by rules many of the issues included in the FNPRM. Again, I believe this FNPRM should be withdrawn until such time as the NNGE is in place and operational.

III. FCC Rulemaking

Should the FCC elect to proceed with the FNPRM, its goal should be to establish minimum rulemaking in this proceeding. Establishing hard-and-fast rules at the level of detail now included in the current FNPRM will stifle evolution and innovative use by Public Safety agencies. Therefore, I recommend that the FCC establish the minimum set of rules necessary to help make nationwide interoperability a reality.

My recommendations for inclusions in any rulemaking are to:

1) **Mandate 3GPP** LTE as a common Standard Technology Platform
   a. 3GPP release 8 of the LTE standard should be the starting point for the network
2) **Stay certain existing mandatory partnership rules**. However, the NNGE should be permitted to enter into partnerships on a local, regional, and nationwide basis.
3) **Adopt a common air interface, specifically LTE E-UTRA**. The standards bodies, including 3GPP, are already working on definitions, enhanced features, and functions of LTE releases and it and other standards organizations are also working on defining the capabilities of LTE Advanced (5G). Therefore, the FCC's final rulemaking should specify LTE Release 8 as the minimum base requirement for over-the-air technology and acknowledge that commercial technologies evolve at a faster pace than Public Safety LMR systems and technology. Therefore, the decision to

upgrade to future releases, to require backward compatibility, and to mandate these upgrades should be left to the NNGE. (see Section II above)

Other items that should be held in abeyance include:

1) **Out-Of-Band Emissions** (OOBE) listed in Paragraph 54 of the FNPRM. While the OOBE proposed appear to be in line with today's standards, until the ownership of the D Block and its implications on interference are determined, the FCC should take no action on these issues.
2) **PLMN-IDs**. The matter of one or multiple should be left to the NNGE. Generally, I feel a single PLMN-ID has significant advantages for the Public Safety broadband network. A single PLMN-ID implies there would be no "roaming" between Public Safety networks and no roaming charges, both of which I find to be desirable. Further, if public/private partnerships are established to share the network on a non-priority basis, the NNGE might determine that a second or more PLMN-ID for use on the network to identify secondary users would be warranted.
3) **Architectural Guiding Principles**. In Paragraph 19, Section 2, there is a list of twelve items the FCC is recommending to be mandated in the rulemaking. However, of these twelve, at least nine should be considered as operational in nature, subject to change as technologies evolve, and thus should not be included in the rulemaking. These 9 items are:
    - Support of baseline applications such as those proposed in the FNPRM (NNGE)
    - Support of roaming and capabilities such as home-routed and local-breakout (NNGE)
    - Support of a nationwide framework for quality of service and priority access (NNGE)
    - Support of security schemes such as those proposed in the FNPRM (NNGE)
    - Support of a minimum level of network spectral efficiency (standards bodies)
    - Support of a minimum level of coverage reliability (95%) (NNGE)
    - Support for device capabilities as proposed in this FNPRM (NNGE)

- Support for interference mitigation schemes (standards bodies and NNGE)
- Test verifications for interoperability (NNGE)

4) **Section 337**. The Commission should provide regional/tribal network operators with the flexibility to offer services directly to any and all users within the broadest valid interpretation of Section 337.

   Specifically, the Commission should acknowledge the Public Safety role of critical infrastructure providers such as utilities and transportation and allow their use of the network.

   The Commission should also encourage, through rules or other means (e.g., spectrum management), the use of the nationwide network and the local networks by federal government agencies.

5) **Secondary Use and Fixed Uses versus Mobile Uses**. The Commission should remove restrictions on secondary uses and fixed uses, allowing local jurisdictions to make decisions on applications and priorities. NOTE: No commercial broadband 700-MHz wireless spectrum carries such restrictions today.

6) **Definition of Interoperability**. I agree with the Commission, in paragraph 16 of the FNPRM, that it should harmonize its definition of interoperability with that established by DHS/OIC and SAFECOM. I further agree this definition should cover both data broadband, narrowband, and voice communications.

7) **Support of Voice and Data Communications**. I agree with the Commission, as stated in paragraph 20 of the FNPRM, that the Network *must* become capable of supporting both Mission Critical Voice and Data communications. However, *nothing* in any of the current or proposed future 3GPP and ATIS standards would provide the type of mission-critical voice needed by Public Safety on an LTE network. Until the standards organizations address this issue, narrowband voice channels and spectrum allocations must be maintained and utilized for mission-critical voice. I believe the commission should NOT address voice applications in this rulemaking until standards bodies have addressed the issue.

8) **Evolution**. I agree with the Commission, as stated in paragraph 24 of the FNPRM, that LTE for Public Safety will gradually evolve and be enhanced over time as the standards bodies work. I believe Public Safety should speak with one voice to the standards bodies in these matters, and suggest the governing structure described above, along with the PSCR function of the Department of Commerce, actively participate in the standards-setting processes.

9) **In Paragraph 29** of the FNPRM, the Commission asks, "Is it necessary to mandate that as voice communications are supported, networks must be upgraded within an appropriate timeframe?" I firmly believe the nationwide network and all local networks must be upgraded together and on a regular basis. This again underscores the need for a Nationwide framework, Nationwide architecture, a minimum number of evolved packet cores and other central services, and a viable funding scheme for ongoing operations as well as capital construction.

10) **Use of the Public Internet**. Paragraphs 40-42 of the FNPRM discuss potential use of the public Internet for interconnection and other services. I strongly believe NO portion of the PSWBN should be constructed using the public Internet. All portions of the PSWBN should be constructed using private long-haul and backhaul networks firewalled or protected from the public Internet and provided by Public Safety, commercial carriers, or other secure sources. I remain convinced that cyber security dictates and the potential for future cyber wars underscore this recommendation.

11) **Priority**. Implementation of priority is a primary reason to construct a PSWBN separately from existing or proposed commercial networks. I believe the NNGE, discussed above, should set some minimum priority scheme for roaming between local Public Safety networks. However, I also believe priorities should largely be set and managed by individual cities or other agencies operating local networks both on a default and incident basis.

12) **Performance**. Paragraphs 58-62 and 71-75 of the FNPRM discuss required performance and coverage characteristics.

The natural and constructed environments of the United States vary widely from city to city, region to region, and even inside cities. Some cities or regions are relatively flat. Others have hills, valleys, mountains, tall buildings, and large expanses of water.

The performance needs of Public Safety and critical infrastructure agencies will vary from jurisdiction to jurisdiction. I firmly believe the Commission cannot set performance requirements in rules and recommend it does not attempt to do so.

I further suggest that backward compatibility of subscriber equipment to other existing commercial technologies (e.g., HSPA+, EVDO) can, in most cases, address performance and coverage requirements until such time as the PSWBN can be built out in a given area.

13) **Roaming and Nomenclature**. Paragraph 87 of the FNPRM describes some definitions for various kinds of Public Safety roamers. I believe this is a matter best left to the governing entity to describe and manage. I do believe there should be no chargeback between Public Safety entities for roaming or use of each others' networks.

14) **Applications To Be Supported for Roamers**. This topic is discussed in paragraph 93-96 of the FNPRM. The required nationwide Public Safety applications need more discussion. However, I do NOT believe access to the public Internet is a required application. Indeed, I am concerned such access presents grave security and operational issues.

Architecture

The Public Safety 700-MHz wireless broadband network should be constructed as follows:

1) **Locally Constructed Components**. Local jurisdictions (cities, regions, states, or multi-state consortia) would construct and govern the local portions of the network, as long as they had a *bona fide* governance structure, formally created by the major jurisdictions in the geography of the network. These components would include:

a. Cell sites
b. RAN
c. Local backhaul between cell sites
d. Subscriber units (mobile and portable or handheld)
e. Well-behaved applications constructed under a set of uniform nationwide standards and guidelines to maximize usability and performance and minimize security risk
f. A local network operating center (if desired)

2) **Nationwide Components**. These components would be nationwide and common. Local operators *must* choose and use these components for operability and interoperability
   a. Evolved Packet Cores, including a network management component that allows local operators to manage the cell sites, priorities, subscriber units, etc. in their area of operation
   b. Roaming Agreements with commercial telecommunications carriers
   c. Backhaul for Interconnection between the local networks and for roaming to the commercial carriers
   d. Nationwide Application Hosting for applications the FCC or NNGE requires all local operators to support
   e. At Least Two Network Operating Centers
3) **Nationwide Components (Optional)**. These components would be nationwide and common. Local operators could optionally choose and use these components for operability and interoperability:
   a. One or more procurement vehicles (i.e., GSA schedule or contract)
   b. Common provisioning system. This would be an online web-based system to easily join users and subscriber units to the network.

IV. Summary

The recommendation I made in the introduction to this filing still makes the most sense for the FCC, Public Safety, and the future of the Public Safety broadband network. The FCC should recall this FNPRM and with others within the federal government and the Public Safety community represented by the Public Safety Spectrum Trust (PSST), Public Safety Alliance (PSA), APCO and NPTSTC, work out a governance strategy and organization (NNGE) for nationwide coordination and the operation of the network.

Until this has been accomplished and funded and the organization has had an opportunity to meet and to decide how to include the waiver recipients and other local jurisdictions into the NNGE, the FCC should take no action on any of these issues. Until the NNGE has had an opportunity to map out a proposed plan of action and has ascertained the types of resources needed to ensure the full and timely implementation of the broadband network, the FCC should stand down.

Once the NNGE is ready, the FCC and the NNGE, along with ERIC and the ERIC advisory groups, should meet and set both a timetable and an agenda for moving forward. While many of the items I have discussed above and in Appendix A can be agreed upon by the NNGE, the FCC, and other federal agencies, the matter of funding for the network's construction and continued operation will mandate that some of these issues remain undecided until it is clear how much of the cost will be borne by the federal government. The idea of passing rulemaking without either the resolution of the status of the D Block or the amount of funding Public Safety can expect is premature.

Other important issues that need to be resolved have to do with the FCC's willingness to permit the NNGE to work with public entities in order to form not one but perhaps many public/private partnerships, and for Public Safety to share the available broadband bandwidth where it is not needed on a daily basis by Public Safety. This too, should wait until the D Block reallocation has been decided by Congress and the Executive Branch. If the D Block is reallocated by law, the number of public/private partnership possibilities would be increased dramatically. Further, Public Safety and many other organizations will be able to serve rural America including rural power companies, individuals, and businesses that do not presently

have access to broadband connectivity. These organizations will multiply, and therefore help with the funding of both the network construction and day-to-day operational expenses.

In the event the FCC feels compelled to move forward with this FNPRM, I have also provided input as to the types of minimum rules I believe should be included. The balance of the items (as shown in Appendix A) should either remain the purview of the various standards organizations or should be turned over to the NNGE for action and/or discussions between the NNGE, the FCC, and other federal agencies.

It does not appear to me that there should be any urgency on the part of the FCC to enact these rules or to make decisions that may, in the future, prove to be unwise, in order to push the process forward. Rather, it makes more sense to step back and wait for the outcome of both the formation of the NNGE and the resolution of the D Block before moving forward with any rulemaking that could impact the network's designs, its ability to provide the types of communications requirements needed by Public Safety, and determination of how many public partners might be available to assist in the build-out and operation of the network going forward.

Respectfully submitted,

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CEO and Principal Consultant

Appendix A

Paragraph-by-Paragraph Classification of FNPRM Document

Below is a recap of the FNPRM document with a notation for each paragraph and the agency or group I believe should have or retain jurisdiction for the topic. Most of them are noted above.

Key:

FCC Rulemaking	Should be part of FCC Rules
NNGE	Should be left to governance group (NNGE)
Standards Bodies	Purview of LTE standards bodies
Standards Bodies and NNGE	Some portions are standards, some NNGE controlled
NNGE/FCC	NNGE and FCC joint discussion and resolution
NNGE/NENA/FCC	Joint discussions with the three organizations
Missing Paragraph Numbers	FCC statements that do not require action
D Block	Until the issue of the reallocation of the D block is acted upon

Page 4,	Paragraph 5	LTE as Standard	FCC Rulemaking
Page 5,	Paragraph 10	LTE as Standard	FCC Rulemaking
Page 6,	Paragraph 11	LTE Backward Compatibility	Standards Bodies
	Paragraph 12	LTE Interfaces	Standards Bodies and NNGE
Page 7,	Paragraph 15	LTE Interoperability	Standards Bodies and NNGE
Page 8,	Paragraph 16	Interoperability	Standards Bodies and NNGE
	Paragraph 17	Nationwide Architecture	NNGE
Page 9,	Paragraph 18	Components of Nationwide Network	NNGE
	Paragraph 19	Network Characteristics	Standards Bodies and NNGE
	Paragraph 20	LTE Voice and Data	Voice Should Not Be Included
	Paragraph 21	Roaming Authentication	NNGE
	Paragraph 22	Nationwide Backbone Network	NNGE
Page 10,	Paragraph 23	Nationwide Service	NNGE
	Paragraph 24	Evolution	Standards Bodies

	Paragraph 26	Network Architecture	NNGE
Page 11,	Paragraph 28	Open Standards	NNGE
	Paragraph 29	Other LTE Capabilities	NNGE
Page 12,	Paragraph 30	IP4 and/or IP6	NNGE
	Paragraph 31	Tunneling Protocol	NNGE
	Paragraph 32	PLMN-ID (Network ID)	NNGE
	Paragraph 33	PLMN-ID (Multiple)	NNGE
Page 13,	Paragraph 34	PLMN-ID Acquisition	NNGE
	Paragraph 35	Roaming	NNGE
	Paragraph 36	Commercial Network Roaming	NNGE
	Paragraph 37	Roaming Authentication	NNGE
Page 14,	Paragraph 38	End-To-End Connections	NNGE
	Paragraph 39	Direct Interconnection	NNGE
	Paragraph 40	Commercial Internet (NO!)	NNGE
	Paragraph 41	Third-Party Backhaul	NNGE
	Paragraph 42	Interconnection Costs	NNGE
	Paragraph 43	Priority and QoS	NNGE
Page 15,	Paragraph 44	Authentication	NNGE
	Paragraph 45	User Priority	NNGE
	Paragraph 46	Priority and QoS Levels	NNGE
	Paragraph 47	Seamless Handover	NNGE
	Paragraph 48	Handoff Method (2)	NNGE
	Paragraph 49	eNode B Handoffs	NNGE
	Paragraph 50	Mobility Speed	Standards Bodies and NNGE
	Paragraph 51	Out-of-Band Emissions	Hold for D Block Resolution
	Paragraph 52	Guard Bands Emissions	Hold for D Block Resolution
	Paragraph 53	D Block Guard Band	Hold for D Block Resolution
	Paragraph 54	Interference	Hold for D Block Resolution
Page 16,	Paragraph 55	Common Applications	NNGE

Page 17,	Paragraph 56	Additional Applications	NNGE
Page 18,	Paragraph 57	Real-Time Voice and Video	NNGE
	Paragraph 58	Broad/Narrowband Interconnect	NNGE
	Paragraph 59	Performance Requirements	Standards Bodies and NNGE
	Paragraph 60	Baseline Interoperability	NNGE then FCC
Page 19,	Paragraph 61	Cell Edge Performance	NNGE
	Paragraph 62	Additional Requirements	NNGE then FCC
Page 20,	Paragraph 64	Capacity Increases	NNGE
	Paragraph 65	Security of Network Traffic	Standards Bodies and NNGE
Page 21,	Paragraph 66	Security Standards	Standards Bodies and NNGE
	Paragraph 67	Network Domain Security	Standards Bodies and NNGE
	Paragraph 68	Application Security	Standards Bodies and NNGE
	Paragraph 69	Optional Security	NNGE
Page 22,	Paragraph 70	Site Back-Up Power	NNGE
	Paragraph 71	Coverage and Performance	NNGE
	Paragraph 72	Coverage by Population	NNGE
Page 23,	Paragraph 73	Rural Coverage	NNGE
	Paragraph 75	Coverage Reliability	NNGE
	Paragraph 76	Bordering Interference	NNGE
	Paragraph 77	Notification of Construction	NNGE
Page 24,	Paragraph 78	Interference Mitigation	NNGE
	Paragraph 79	PS Coordination with Commercial	NNGE
	Paragraph 80	Narrowband In Broadband	NNGE (Funding Issue)
Page 25,	Paragraph 81	Relocation of Narrowband Users	NNGE (Funding Issue)
	Paragraph 82	How To Relocate	NNGE then FCC
	Paragraph 83	Narrowband In Broadband	NNGE then FCC (Funding)
	Paragraph 84	Narrowband In Broadband	NNGE then FCC (Funding)
Page 26,	Paragraph 85	Public Safety Roaming	NNGE
	Paragraph 86	Same Network Roaming	NNGE

	Paragraph 87	Roaming Types	NNGE
	Paragraph 88	Regional Roaming	NNGE
Page 27,	Paragraph 89	Roaming Obligation	NNGE
	Paragraph 90	Intra-System Priority	NNGE then FCC
	Paragraph 91	Priority Triggers	NNGE
	Paragraph 92	Standardized QoS	NNGE
	Paragraph 93	5 Standard Applications	NNGE
Page 28,	Paragraph 94	Roaming Costs	NNGE
	Paragraph 95	PS Roaming Charges	NNGE
	Paragraph 96	PS Roaming Charge Fees	NNGE
	Paragraph 97	Volume of Roaming Traffic	NNGE
	Paragraph 98	Standard Lease for Spectrum	NNGE
Page 29,	Paragraph 99	Standard Roaming Agreement	NNGE
	Paragraph 101	Federal Use of PSBBN	NNGE/FCC
	Paragraph 102	Federal Use of Network of Networks	NNGE/FCC
Page 30,	Paragraph 103	Leasing Option for Federal Use	NNGE/FCC
	Paragraph 104	Federal Roaming	NNGE/FCC
	Paragraph 105	Federal Intra-System Roaming	NNGE/FCC
Page 31,	Paragraph 106	Conformance Testing	NNGE/FCC
	Paragraph 107	Timing of Testing	NNGE/FCC
	Paragraph 108	LTE Infrastructure Testing	NNGE/FCC
	Paragraph 109	Self-Certify Tests	NNGE/FCC
	Paragraph 110	Testing: Air/Roaming	NNGE/FCC
Page 32,	Paragraph 111	IOT and Roaming Interfaces	NNGE/FCC
	Paragraph 112	Commercial Network Testing	NNGE
	Paragraph 113	IOT Rules for Multi-Vendor	NNGE/FCC
	Paragraph 114	IOT Testing Timeframe	NNGE/FCC
	Paragraph 115	IOT Testing Labs	NNGE/FCC
Page 33,	Paragraph 116	Verification of PS Networks	NNGE/FCC

	Paragraph 117	Network Management	NNGE/Others
	Paragraph 118	Network Deployment Reports	NNGE/FCC
	Paragraph 119	Devices	NNGE/FCC
Page 34,	Paragraph 120	Channel Bandwidth-Devices	NNGE/D Block Resolution
	Paragraph 121	Band Class 14 Support	NNGE/D Block Resolution
	Paragraph 122	Multiple Mode Support	NNGE/D Block/FCC
	Paragraph 123	In-Building Coverage	NNGE
Page 35,	Paragraph 124	Mission-Critical Voice/Data	NNGE/FCC
	Paragraph 125	Distributed Antenna Systems	NNGE/FCC
	Paragraph 126	Other In-Building Coverage	NNGE/FCC
	Paragraph 127	Deployable Assets	NNGE/FCC
Page 36,	Paragraph 128	Backhaul for Deployables	NNGE/FCC
	Paragraph 129	Fixed Station Operation	NNGE/FCC
	Paragraph 130	4.9 GHz Spectrum Usage	NNGE/FCC
Page 37,	Paragraph 131	4.9 GHz & 700 MHz Complement	NNGE/FCC
	Paragraph 133	Broadband and NG 911 Networks	NNGE/NENA/FCC
	Paragraph 134	Eligible Users	NNGE/FCC
Page 38,	Paragraph 135	Secondary Use of Spectrum	NNGE/FCC
	Paragraph 136	Mixed Use of 700-MHz Broadband	NNGE/FCC
	Paragraph 137	Authorized Non-Governmental Users	NNGE/FCC
	Paragraph 138	Commercial Use of Spectrum	NNGE/FCC
Page 39,	Paragraph 139	Section 337 Shared Use Violation?	NNGE/FCC
	Paragraph 140	Other Conditions for Use	NNGE/FCC