

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 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
)	

**COMMENTS OF
ALCATEL-LUCENT**

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TABLE OF CONTENTS

I.	INTRODUCTION.....	1
II.	THE COMMISSION MUST ACT DECISIVELY AND DECIDE BASIC NETWORK REQUIREMENTS IN A COMMERCIALLY REASONABLE MANNER FOR THE D BLOCK RE-AUCTION AND THE PUBLIC/PRIVATE PARTNERSHIP TO BE A SUCCESS.....	2
III.	THE COMMISSION SHOULD CLARIFY OTHER ELEMENTS TO ENHANCE EFFICIENT USE OF THE SPECTRUM AND COMMERCIAL VIABILITY.	7
	A. The Commission Should Permit Combined Spectrum with Assured Engineered Capacity.....	7
	B. The Commission Should Clarify the Priority Access Obligation.	9
IV.	THE COMMISSION SHOULD ALLOW REGIONS TO DEPLOY COMPATIBLE BROADBAND NETWORKS IN ADVANCE OF THE PUBLIC SAFETY BROADBAND LICENSEE’S PLAN	10
V.	CONCLUSION	12

EXECUTIVE SUMMARY

Alcatel-Lucent (“ALU”) supports the Commission’s continuing commitment to the 700 MHz public/private partnership and the deployment of a national, interoperable broadband public safety network. Having successfully constructed the first 700 MHz interoperable public safety broadband network, the National Capital Region system in the Washington, DC area, ALU can attest to the public benefits that such a network can provide. The Commission’s charge in this proceeding is to establish a set of requirements that will meet public safety’s needs while providing prospective bidders with sufficient certainty that the network to be constructed will be commercially viable.

As a threshold matter, the Commission should identify public safety applications and services that must be supported across the network, in urban, suburban, and rural areas. The requirements must be commercially viable for buildout in more remote areas and not just dense urban markets. At the same time, where the network is enhanced to support commercial demand, the Commission should require that public safety users have access to the same data rates and the full range and suites of capabilities and applications available to commercial users.

In furtherance of these objectives, ALU urges the Commission to adopt a baseline of desired public safety operational capabilities. ALU supports the applications and operational capabilities identified in the Technical Appendix to the *Second FNPRM*, including text, voice, secure voice, data, video, photographs and detailed graphical information.

The Commission also should adopt baseline service/coverage requirements. ALU recommends the following: (1) a minimum cell edge data rate of 256 kbps on the forward link (base to mobile), and 128 kbps (mobile to base) on the reverse link; (2) a link budget supporting 95% (area) coverage reliability corresponding to 90% (edge) contour reliability; and (3) a median throughput per transceiver in excess of 1 Mbps downstream and 600 kbps upstream over 50% of the service area. As technology evolves and matures, higher rates will be achievable at the cell edge. While these requirements generally exceed typical commercial RF network design specifications available today, they are compatible with evolving technology and are consistent with the types of applications set forth in the *Second FNPRM’s* Technical Appendix.

ALU also urges the Commission to clarify other elements of its proposal to enhance efficient spectrum use and commercial viability. First, the Commission should allow the D Block licensee to combine all 20 MHz of network capacity as a blended, fungible resource, subject to each party’s respective capacity and priority rights. Second, the Commission should clarify that the public safety licensee is entitled to a priority access right, consistent with the Wireless Priority Service, with respect to the D Block licensee’s spectrum capacity. Finally, the Commission should allow public safety regions to construct and deploy network facilities ahead of the D Block licensee, with rights of reimbursement, providing such facilities are technically compatible with the shared nationwide network.

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To: The Commission

COMMENTS OF ALCATEL-LUCENT

Pursuant to Section 1.415 of the Commission’s rules, 47 C.F.R. § 1.415, Alcatel-Lucent (“ALU”)¹ respectfully submits these comments in response to the Commission’s Second Further Notice of Proposed Rulemaking (“*Second FNPRM*”) in the above-captioned proceeding.²

I. INTRODUCTION

ALU supports the Commission’s continuing commitment to the deployment of a nationwide, interoperable broadband public safety network and commends the Commission for its ongoing pursuit of a 700 MHz public/private partnership to transform this objective into reality. The National Capital Region broadband network, constructed by ALU to serve public safety agencies in Washington, DC and surrounding areas, demonstrates the benefits of an

¹ ALU is a global leader in fixed, mobile and converged broadband access, carrier and enterprise IP technologies and services. With 77,000 employees and operations in more than 130 countries, ALU is one of the largest research, technology and innovation organizations in the world focused on communications. ALU provides solutions that enable service providers, enterprises and governments worldwide to deliver voice, data and video communication services to end users.

² *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, et al.*, Second Further Notice of Proposed Rulemaking, FCC 08-128 (rel. May 14, 2008) (“*Second FNPRM*”).

interoperable broadband public safety network based on commercial technologies. First responders across the nation should be afforded the same benefits. This important goal is achievable, provided the Commission revises the 700 MHz public/private partnership requirements to assure that the network will be commercially viable.

Despite the Commission's laudable efforts last year to establish a framework for a public/private partnership, uncertainties proved too great to attract a winning bid on the D Block. The risks, as the Commission's Office of Inspector General reported, largely related to the uncertainty involved in post-auction negotiations with the Public Safety Broadband Licensee ("PSBL"), the costs of network buildout and operations, and the consequences if agreement could not be reached.³

As the Commission revisits the rules for a 700 MHz public/private partnership, it is clear that the challenges are substantial – but surmountable. The Commission appropriately seeks comment on changes to the existing structure that will "provid[e] sufficient assurances to bidders for the D Block license that the required shared network will be commercially viable."⁴ ALU respectfully submits these comments to help identify a path forward, and to make the reauction and the public/private partnership a success.

II. THE COMMISSION MUST ACT DECISIVELY AND DECIDE BASIC NETWORK REQUIREMENTS IN A COMMERCIALY REASONABLE MANNER FOR THE D BLOCK RE-AUCTION AND THE PUBLIC/PRIVATE PARTNERSHIP TO BE A SUCCESS.

The core of this proceeding can be summed up in a single question from the *Second FNPRM*: "How can we establish a set of requirements that will meet public safety's needs while providing prospective bidders with sufficient certainty that it will be possible to construct a

³ See FCC Office of Inspector General Report, at 2 (rel. Apr. 25, 2008).

⁴ *Second FNPRM* at ¶ 58.

system that is economically viable?”⁵ Reasonable certainty regarding network requirements is imperative, and the Commission therefore should identify system requirements with some specificity. Such requirements, however, must represent commercially reasonable deployment. Absent such assurance, ALU fears that a D Block re-auction will be doomed to the same fate as the initial attempt.

The Commission should adopt a baseline level of service capability and application performance criteria for public safety users, consistent with current and evolving commercial technologies, that would be made available across the network – in urban, suburban, and rural areas. The requirements must be commercially viable for buildout in more remote areas and not just in dense urban markets. At the same time, where the network is enhanced to support commercial demand, the Commission should require that public safety users have access to the same data rates and the full range and suites of capabilities and applications available to commercial users.

The Commission appropriately asks how technical requirements in existing public safety networks “differ based upon factors such as intended user base and local morphology” – “e.g., urban vs. rural environments[.]”⁶ Fundamentally, the nature of supported applications determines desired minimum data rates; data rates, in turn, impact the number of base stations to be deployed; and the extent of base station deployment correlates directly to the capital expenditure requirements necessary to build a network. Commercial wireless providers *and* public safety agencies deploying wireless systems take these realities into account as they necessarily balance user needs and system costs. As a general matter, therefore, system requirements and operational capabilities vary according to morphology. For example, the 2002

⁵ *Id.* at ¶ 72.

⁶ *Id.* at ¶ 67.

New York State RFP for the Statewide Wireless Network identified different coverage and capability requirements for New York City and other specified locations in comparison with the rest of the state.⁷ The Public Safety Spectrum Trust’s (“PSST”) Bidder Information Document (“BID”) Version 2.0, issued before Auction 73, identified desired capabilities of the shared network and also recognized differing levels of throughput based on morphology.⁸

Here, the Commission should identify public safety applications and services that must be supported across the entire network, and these requirements necessarily must account for the balancing of public safety user needs and system costs in remote areas. This undertaking involves two steps: the identification of desired operational capabilities; and an assessment of service coverage requirements. As noted above, the Commission should take action to assure potential bidders that the network requirements are defined – and commercially reasonable.

The *Second FNPRM’s* Technical Appendix observed that the network should support text, voice, secure voice, data, video, photographs and detailed graphical information.⁹ It went on to list the operational capabilities put forward in the PSST’s BID Version 2.0 (provided in the Appendix to these comments). ALU supports these operational capabilities as the baseline service and application capability requirements for the public/private partnership network.¹⁰ Minimum performance criteria for each application, and the availability of the latter, should be

⁷ *Competitive Procurement For: New York State Statewide Wireless Network*, NYS RFP 01-007, Vol. 1, at 139, § 2.01, Table 1 (rel. June 6, 2002) available at <http://www.oft.state.ny.us/SWN/RFPV011.pdf>.

⁸ Public Safety Spectrum Trust, *Public Safety Spectrum Trust Public/Private Partnership Bidder Information Document*, Version 2.0, at 8 Tables 2.4.2-A & 2.4.2-B (Nov. 30, 2007) (“*BID Version 2.0*”) (identifying dense urban, urban, suburban, rural and highway morphology categories for coverage and reliability levels) (“*BID Version 2.0*”).

⁹ *Second FNPRM* at Appendix, p. 86.

¹⁰ We note, however, that the Commission should condense the “indoor video” and “outdoor video” categories into a single category as the difference identified in the BID table reflects service coverage issues rather than differing applications.

consistent with commercial standards deployed in the marketplace.¹¹ In urban areas, it is likely that data rates will be more robust during the initial build out. Public safety of course should have access to the same data rates and all current and evolving commercial services and applications available on the public/private network.

The Commission should also clearly identify service coverage requirements based on commercially reasonable parameters. An example of network specifications that will support minimum service provision across the network could include the following:

1. A minimum cell edge data rate of 256 kbps on the outbound link (base to mobile) and 128 kbps (mobile to base) on the inbound link;
2. A link budget supporting 95% (area) coverage reliability corresponding to 90% (edge) contour reliability; and
3. A median throughput per transceiver in excess of 1 Mbps downstream and 600 kbps upstream over 50% of the service area.

While those requirements generally exceed today's typical commercial RF network design specifications, ALU supports those minimum requirements as they are compatible with the types of applications identified in BID Version 2.0 and included in the *Second FNPRM's* Technical Appendix and, more importantly, they strike an appropriate balance between public safety needs and infrastructure and deployment costs. ALU also notes that these requirements are generally consistent with the minimum service provisions established for the operational public safety wireless broadband network in the National Capital Region.¹² As technology evolves and matures, higher rates will be achievable at the cell edge.

¹¹ An excellent example includes 3GPP TS 22.105, "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Service aspects; Services and service capabilities."

¹² See NCR Interoperability Program, *Request for Proposal: National Capital Region Interoperability Wireless Broadband Networks*, POTO-2006-R-0045, at 33, § C.3.1. (Sept. 8, 2006).

In-building penetration capabilities have a tremendous impact on the number of base stations that must be deployed, and hence in-building coverage requirements would be an important factor in assessing the economic viability of a network. As an initial matter, commercial wireless networks operating in urban and suburban areas today offer significant in-building coverage. The shared network as described above, which is engineered to provide high data rates outdoors, should support in-building voice services in most areas, and in many cases modest data transfer speeds supporting email and instant messaging. Over time, commercial market dynamics will help drive the D Block licensee to provide even higher levels of in-building coverage for public safety.¹³ Because video is likely the public safety application with the highest data rate requirements, care must be taken to ensure that support of video across the service area provides public safety with mission-critical operational capabilities without compromising the economic viability of the public/private partnership. As demonstrated by the National Capital Region deployment, public safety has reliable access to mission-critical video capabilities across the service area based on generally consistent network specifications. Requiring data rates at the cell edge significantly higher than the levels identified above on a network-wide basis would not be commercially viable, although urban areas will likely have such capability.

Certain network requirements previously identified during this proceeding would be in direct tension with the goal of establishing certainty for a commercially viable network. For

¹³ We note that public safety's critical need for reliable in-building voice communications can and should be addressed using current narrowband channels. Support of indoor broadband services will evolve over time, propelled by the D Block licensee's commercial customer base. For instance, the initial public/private network may require support of video applications at commercially-viable rates outdoors. The design link budget could assume a laptop computer inside of a vehicle with no external vehicular mounted antenna. This scenario is similar to the on-street coverage provided to portable handsets or PDAs. Over time, in-building broadband capabilities can be provided through various means, including deployment of micro- and pico-cells, distribution systems or additional macro sites on a need basis.

example, the PSST's BID sought service coverage requirements with downlink data rates of 1 Mbps at the cell edge in urban areas and 512 kbps at the cell edge in suburban and rural areas, with markets to be launched no later than the first quarter 2010.¹⁴ These edge data rates are not supported by today's commercial networks, and there are significant operational, timing, and financial risks associated with setting requirements based on technologies that have yet to be commercially deployed. ALU fears that efforts to drive the network beyond commercial reasonableness will result in another doomed auction. Instead, ALU urges the Commission to adopt baseline requirements that, at the cell edge across the network, would satisfy the threshold demands required by the public safety applications identified in the Technical Appendix.

Again, where commercial demand drives enhanced network deployment, the Commission should require that public safety gain access to the same services and applications and coverage capabilities. This approach allows for an easy migration from 3G to 4G networks and, with multimode devices, will allow seamless operations going forward.¹⁵ In this way, the Commission can ensure rapid deployment and a commercially viable public/private partnership.

III. THE COMMISSION SHOULD CLARIFY OTHER ELEMENTS TO ENHANCE EFFICIENT USE OF THE SPECTRUM AND COMMERCIAL VIABILITY.

A. The Commission Should Permit Combined Spectrum with Assured Engineered Capacity.

The Commission seeks comment on whether it should amend its rules to allow the D Block licensee to construct and operate the shared wireless broadband network using the 20 MHz of D Block spectrum and public safety spectrum "as a combined, blended resource."¹⁶ The

¹⁴ *BID Version 2.0* at 7-8 & Table 2.4.2-A.

¹⁵ Planned evolution from 3G to 4G technologies by the major US commercial operators should help ensure the availability of suitable multimode devices.

¹⁶ *Second FNPRM* at ¶ 80.

combined spectrum would be “fungible” such that spectrum would “be assigned to users without regard to whether a public safety user is being assigned frequencies in the D Block or a commercial user is being assigned frequencies in the public safety broadband spectrum” subject to their respective capacity and priority rights.¹⁷ ALU supports these proposals.

As a threshold matter, ALU submits that such flexibility gives network operators greater technology choice. As a technical matter, modern network software can dynamically manage and assign spectrum across a single network platform to multiple classes of users and user groups, making frequency (block) sub-division of the band unnecessary. Unfettered flexibility to the full 20 MHz of spectrum, without artificial, government-mandated frequency segmentation, will enable prudent technology choices and potential migration, and efficient use of spectrum.

Further, combined use is consistent with the requirements of Section 337 of the Act.¹⁸ First, combining all 20 MHz into a fungible pool of spectrum comports with Section 337(a), which requires the Commission to allocate 24 MHz of spectrum in the 746–806 MHz band to public safety. The Commission has completed this allocation and, under the approach described above, public safety will have access to the engineered capacity of 24 MHz of spectrum. Of course, public safety would be assured spectrum capacity, on a primary basis, consistent with the spectrum assigned to the PSBL. The *Second FNPRM’s* Technical Appendix appropriately characterized the right as “50 percent of the engineered RAN capacity” of the public/private partnership network.¹⁹ Second, a combined spectrum approach is consistent with Section 337(f), which defines the eligible classes of users that provide “public safety services.” As the Commission concluded in the *Second Report and Order (“Second R&O”)*, “the definition of

¹⁷ *Id.*

¹⁸ *Id.* at ¶ 81; 47 U.S.C. §§ 337(a),(b).

¹⁹ *Id.* at Technical Appendix, p. 80 n.254.

‘public safety services’ does not foreclose the secondary preemptible commercial use” of the public safety spectrum,²⁰ and public safety users will retain primary rights on the PSBL’s engineered capacity rights – resulting in access to, in effect, 24 MHz of spectrum when combined with the narrowband public safety spectrum.

B. The Commission Should Clarify the Priority Access Obligation.

The Commission also seeks comment on whether it should continue to require the D Block licensee to provide the PSBL with priority access to its spectrum during emergencies.²¹ ALU urges the Commission to clarify the priority access right.

As an initial matter, consistent with the discussion above, public safety priority access to D Block spectrum during emergency events would involve access to D Block spectrum capacity – 50 percent of the network’s engineered RAN capacity – rather than defined D Block spectrum frequencies. Likewise, the D Block licensee’s secondary access right to the PSBL spectrum involves access to public safety spectrum capacity rather than defined spectrum frequencies.

The Commission also should clarify the PSBL priority access right to D Block spectrum capacity during emergency events. The *Second Report and Order* observed that “public safety entities will have priority access to the Upper 700 MHz D Block spectrum during emergencies,” but did not definitively explain “priority access.”²² The Commission should take the opportunity to clarify that the priority access right is akin to the current Wireless Priority Service (“WPS”) – meaning public safety users would be placed at the top of the queue for the next available

²⁰ *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Report and Order, 22 FCC Rcd 15289 at ¶ 420 (2007) (“*Second R&O*”)

²¹ *Second FNPRM* at ¶ 84.

²² *Second R&O* at ¶ 399.

commercial D Block spectrum capacity, but ongoing commercial communications would not be interrupted to allow public safety use.²³

In order to further the commercial viability of the public/private partnership, ALU also urges the Commission to limit priority access to some percentage of the D Block spectrum capacity – perhaps up to 50 percent as suggested in the *Second FNPRM*.²⁴ If public safety were permitted to access up to 100 percent of the commercial spectrum capacity, it would significantly impair the D Block licensee’s ability to market its services to both commercial and retail customers who could face the complete loss of all communications capability during an emergency due to the priority access rights of public safety licensees. Finally, the Commission should make explicit that public safety priority access to commercial capacity during an emergency event must be limited to the geographic and/or jurisdictional area directly affected by the emergency.

IV. THE COMMISSION SHOULD ALLOW REGIONS TO DEPLOY COMPATIBLE BROADBAND NETWORKS IN ADVANCE OF THE PUBLIC SAFETY BROADBAND LICENSEE’S PLAN

Based on its experiences with the National Capital Region public safety broadband network, ALU fully expects that there will be widespread public safety demand for interoperable, broadband services as contemplated in this proceeding. Yet, despite the aggressive D Block buildout requirements, there will be some regions where the network will be deployed in the out years – or not at all. ALU urges the Commission to allow local and regional public safety entities to control their circumstances and to commence construction of network

²³ *Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010*, Second Report and Order, 15 FCC Rcd 16720 (2000). The Technical Appendix attached to the *Second FNPRM* presumes a that the mandated priority access would be consistent with WPS. See *Second FNPRM* , Appendix at 84.

²⁴ *Second FNPRM* at ¶ 87.

facilities in advance of the PSBL – a practice endorsed by the Commission earlier in this proceeding.

Specifically, the Commission’s *Second Report and Order* concluded that the public interest would be served by allowing public safety entities to engage in “early buildout” construction in those areas already slated for construction, under two different options.²⁵ Under the first option, the public safety entity (or the PSBL acting on its behalf) is allowed to construct a network in an area, but must convey ownership of the network to the D Block licensee upon construction, subject to reimbursement and other obligations.²⁶ Under the second option, the public safety licensee may obligate the D Block licensee to complete construction in its area, providing it all necessary funds, including expenses for any additional resources or personnel.²⁷ In both instances, the D Block licensee is obligated to “operate and manage the network as an integrated part of the larger, shared national broadband network.”²⁸

ALU fully supports this policy as an innovative means for accelerating the deployment of much needed wireless broadband capacity to the public safety community. Toward this end, ALU also urges the Commission to clarify that a regional or local public safety entity may construct a network that is compatible with the national network, either meeting or exceeding the technical requirements of the national network or capable of migrating to the D Block licensee’s technology of choice. In any event, the regional or local public safety entity should be entitled to fair compensation in these circumstances should the D Block licensee wish to acquire the network or operate in the relevant geographic area.

²⁵ *Second R&O* at ¶ 472 (2007).

²⁶ *Id.*

²⁷ *Id.*

²⁸ *Id.*

V. CONCLUSION

Alcatel-Lucent supports the Commission's continued commitment to a 700 MHz public/private partnership and, to that end, urges the Commission to refine the rules governing the D Block and the public/private partnership in the ways described above to ensure that the network is commercially viable.

Respectfully submitted,

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APPENDIX

PSST BID Version 2.0 Network Services and Applications Expectations Table 2.9.2-A

Table 2.9.2-A

Application/Service	Description	Data Rate
File transfer	Download of such items as high-resolution images, GIS data, etc.	Greater than 256 kb/s
Email		Less than 16 kb/s
Web browsing		Greater than 32kb/s
Cellular voice	Analogous to CMRS Voice	4-25 kb/s
Push to talk voice	Analogous to CMRS PoC	4-25 kb/s
Indoor video	Video that is transmitted from inside a building / tactical or surveillance	20-384 kb/s
Outdoor video	Video that is transmitted from the street / tactical or surveillance	32-384 kb/s
Location services	This includes location services for personnel, vehicles and other objects	Less than 16kb/s
Database transactions	This includes both remote and local jurisdictional databases	Less than 32kb/s
Messaging	Instant messaging and SMS type services, both one-way and two-way.	Less than 16kb/s
Operations data	This is a catch all for data that deals with the operations and maintenance of the network, i.e. over the air programming, remote client management, etc.	Less than 32kb/s
Dispatch data	This area primarily covers data as it relates to computer aided dispatching.	Less than 64kb/s
Generic traffic	This is a catch all for traffic that doesn't fall within any of the categories described above, and that generates less than 64kb of data per second.	Less than 64kb/s
Telemetry	Remote measurement and reporting of information for radio devices, vehicles, etc. Also includes sensors data such as passive chemical detection. Additionally, biometric sensors that require better network performance are also included in this application class.	70-120 kb/s
Virtual Private Networking		Less than 64kb/s