

commercial service providers to satisfy their wireless broadband needs, none of these jurisdictions have stated that these networks provide anything more than commercial-grade service, or that they were able to achieve the economies of scale and nationwide interoperability inherent in the 700 MHz Public/Private Partnership approach. As more and more public safety agencies take advantage of the benefits of broadband applications, we are concerned that in the end we will again end up with balkanized networks incapable of even minimum interoperability.<sup>105</sup> Again, when faced with future calamities, the Nation will continue to suffer from the same dangerous shortcomings that were encountered following natural and man-made disasters of the past because there will remain no dedicated public safety spectrum with a nationwide level of interoperability. We also remain concerned that, due to the funding issues discussed above, such local or regional efforts will occur only in a few jurisdictions, leaving most of the country's public safety community without wireless broadband for the foreseeable future. In contrast, the 700 MHz Public/Private Partnership rules proposed herein will provide a plan to provide broadband coverage for public safety entities on a significantly more expanded basis than individual agreements with commercial service providers or build-out by individual jurisdictions in the 700 MHz broadband spectrum could achieve.

55. As noted above, some commenters have argued that, whatever benefits the 700 MHz Public/Private Partnership might possess, the model cannot be made commercially viable except by reductions in the network design and coverage requirements that would sacrifice its suitability as a public safety network. We recognize that, for the 700 MHz Public/Private Partnership to achieve the objectives of this proceeding, it must meet the essential requirements of public safety communications systems and also provide a level of commercial viability sufficient to encourage investor participation and to permit long-term commercial success in a competitive environment. We also acknowledge that there is some tension between these goals. To the extent that the network is required to meet higher standards for reliability, hardening, security, and other features than are being implemented in competing commercial broadband networks, and to build out in commercially unprofitable areas, such costs will pose an additional challenge to the commercial viability of the network. We also note that the financial challenges posed by the construction and operation of the shared wireless broadband network may be exacerbated by the prevailing condition of the nation's economy overall and its impact on the availability of capital.<sup>106</sup>

56. Based on the record before us, however, we tentatively conclude that it is possible to establish requirements that are commercially viable while still meeting the essential requirements of public safety first responders. First, we anticipate that a part, although likely not all, of the incremental cost of meeting public safety specifications and construction will be accounted for in the discounted price of the auctioned D Block spectrum.<sup>107</sup> In addition, we find that certain reductions or modifications of the requirements in the existing rules are consistent with the Commission's fundamental public safety

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<sup>105</sup> We note that existing rules permit local jurisdictions to construct independent networks operating over the 700 MHz public safety broadband spectrum, with certain limitations and conditions, in the event that the shared wireless broadband network is not scheduled to cover the relevant jurisdiction by the end of the D Block license term. See 47 C.F.R. § 27.1330(b)(5). In addition, these rules provide local jurisdictions with a method, again with certain conditions, to construct a network prior to the anticipated construction date of the shared wireless broadband network in that jurisdiction, subject to later integration. See *id.* As discussed elsewhere, we tentatively conclude that we should retain these rules.

<sup>106</sup> See Council Tree Comments at ii.

<sup>107</sup> See APCO Comments at 37. But see Verizon Wireless Comments at 8 ("the D Block and public safety broadband spectrum are not worth nearly enough to offset the massive cost of building a national broadband network to the mission-critical specifications of public safety . . . even if the D Block were given away for free," and estimating the incremental costs of hardening and build-out beyond commercial footprints at over \$20 billion). See also APCO Comments at 37.

objectives, and will significantly improve the commercial viability of the 700 MHz Public/Private Partnership, thus enhancing the likelihood that public safety users will in fact receive the benefits we seek to achieve in this proceeding. We also expect that, to some extent, additional public safety-related requirements should provide some degree of market advantage, particularly to public safety users and others, such as critical infrastructure users.<sup>108</sup> We note that despite our tentative conclusion that entities such as critical infrastructure users are not eligible for service as public safety users, they may still receive service as customers of the D Block licensee(s).<sup>109</sup>

57. We do find that many of the specific problems noted by commenters regarding the existing rules governing 700 MHz Public/Private Partnership present legitimate concerns. We tentatively conclude that these issues can be successfully addressed, however, through appropriate rule modifications. On the commercial side, we agree, for example, that for potential bidders to make an informed determination regarding the viability of the partnership, they must have reasonable certainty and clarity regarding their obligations under the rules, and thus, the likely costs of constructing and operating the shared wireless broadband network. They also need to have some ability to predict the revenue potential of the shared wireless broadband network. While we may not have provided sufficient certainty on either of these factors under the existing rules, we are persuaded that it is possible to provide such certainty. Conversely, regarding certain public safety objections that the commercial D Block licensee will not adequately serve their interests, we find that appropriate oversight measures, including reporting requirements, can address these concerns. Accordingly, in the sections below, we address these issues in greater detail and reach tentative conclusions regarding how best to implement the 700 MHz Public/Private Partnership to respond to these concerns.

58. Though we tentatively conclude that we should retain the public/private partnership and assign commercial licenses for the D Block by competitive bidding, we also seek comment on whether assigning licenses through a Request for Proposal (RFP) process would increase the likelihood of successfully deploying a nationwide interoperable broadband network useable by public safety. We seek comments on both a detailed proposal for how the RFP process would be conducted, as well as why it would be superior to an auction of licenses consistent with the rules proposed herein. We seek comment as well on whether any RFP process would be consistent with the Commission's obligations under Sections 309(j) and 337(a) with respect to the allocation of spectrum and the method of assigning D Block licenses.

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<sup>108</sup> See, e.g. SouthernLINC Reply Comments at ii, 4 (noting that, "given its hardened network and best of class design, public safety agencies throughout SouthernLINC's territory have relied on SouthernLINC for day-to-day and emergency operations since the network became operational in 1995," and that nearly one-quarter of its customer base is comprised of "federal, state, and local agencies"). But see Motorola Comments at 4-5 (stating that the number of first responders is "insufficient . . . to amortize the high costs associated with hardening the network and constructing infrastructure covering over 99.3 percent of the U.S. population.").

<sup>109</sup> We note that the record provides some evidence indicating that networks have already been constructed that are both suitable for public safety use and commercially viable. SouthernLINC, for example, notes that since 1995, it has operated a commercial network "specifically designed to withstand the stressful weather conditions caused by hurricanes in the Southeast," with features "far more robust than a traditionally-designed, commercial-grade network designed with some additional redundancy." SouthernLINC Reply Comments at 3-4; but see *id.* at 4 ("[a] true public-private partnership can work, but it is not easy, and the Commission should recognize that this proceeding may not be the right vehicle to make it happen"). In addition, PGCC, after reviewing the results of a project to construct a Wi-Fi network over a 30-mile corridor in Arizona for public safety and other users, concluded that the "experience supports the FCC position proposing to use D-Block and the adjacent Public Safety spectrum for nationwide broadband connectivity with commercial ownership subject to Public Safety constraints." PGCC Comments at 11.

**B. Service Rules for the D Block Licensee and the 700 MHz Public/Private Partnership****1. Geographic Area for D Block License**

59. Background. In the *Second Report and Order*, we determined that the D Block license would be auctioned as a single, nationwide license.<sup>110</sup> In the *Second Further Notice*, we revisited this decision, in part, because no bidder matched the reserve price the Commission set for the D Block license.<sup>111</sup> In addition to asking if we should retain the single, nationwide license approach, we proposed authorizing the D Block among multiple licensees and asked several questions related to such a proposal. We asked what size the license areas should be if the D Block were split into regional licenses? For instance, should the blocks be Regional Economic Area Groups (REAGs), Economic Areas (EAs), or Cellular Market Areas (CMAs)?<sup>112</sup> We also sought comment on whether the D Block should be split into one license (or several licenses) covering high-population density areas and a second license (or set of licenses) covering low-population density areas.<sup>113</sup> We further sought comment on whether we should modify any of the policies or rules previously adopted or proposed with respect to a D Block 700 MHz Public/Private Partnership to ensure that the primary goal of a national, interoperable, communications network for public safety agencies is not jeopardized.<sup>114</sup>

60. Commenters offer divergent views on whether the Commission should maintain the single, nationwide, license approach or allocate the D Block through multiple, smaller, regional licenses. Sprint Nextel, Rural Cellular Association (RCA), Ericsson, Inc. (Ericsson), the PSST, the Association of Public Safety Communications Officials (APCO), National Public Safety Telecommunications Council (NPSTC), and most public safety organizations prefer the single, nationwide license approach because, they contend, it should present the most cost effective approach to designing a broadband network that achieves interoperability and connectivity across geographic regions on a nationwide basis.<sup>115</sup> Some commenters object to regional licensing on grounds that some or even many regions might go unsold at auction, resulting in checkerboard coverage.<sup>116</sup> NPSTC argues that integrating regional networks would present technical and logistical challenges and could take years to implement.<sup>117</sup>

61. A number of commenters, however, favor a regional approach. AT&T, Verizon Wireless, and smaller regional service providers, such as MetroPCS, United States Cellular Corporation US Cellular and Rural Telecommunications Group (RTG), prefer the multiple, regional license approach

<sup>110</sup> *Second Report and Order*, 22 FCC Rcd at 15420 ¶ 369.

<sup>111</sup> *Second Further Notice*, 23 FCC Rcd 8047, 8048-49 ¶ 1.

<sup>112</sup> *Second Further Notice*, 23 FCC Rcd at 8111-12 ¶ 183.

<sup>113</sup> *Second Further Notice*, 23 FCC Rcd at 8112 ¶ 185.

<sup>114</sup> *Second Further Notice*, 23 FCC Rcd at 8112 ¶ 184.

<sup>115</sup> APCO Comments at 40; see also, International Municipal Signal Association, International Association of Fire Chiefs, Inc., Congressional Fire Services Institute, and Forestry Conservation Communications Association (IMSA et al.) Comments at 12; National Association of Telecommunications Officers and Advisors, National Association of Counties, National League of Cities, and U.S. Conference of Majors (NATOA, et al.,) Comments at 17; National Public Safety Telecommunications Council (NPSTC) Reply Comments at 9; Region 33, 700 MHz Planning Committee (Region 33) Comments at 19-21; Virginia Fire Chiefs Association (VFCA) Comments at 3; Rural Cellular Association (RCA) Comments at 2; Sprint Nextel Comments at 11; Public Safety Spectrum Trust Corporation (PSST) Reply Comments at 12; Testimony of Chief Harlin R. McEwen, Chairman, PSST FCC *En Banc* Hearing, New York, July 30, 2008 at 2; Ericsson Comments at 34; Council Tree Reply Comments at 13; Intelligent Transportation Society of America (ITS America) Reply Comments at 3.

<sup>116</sup> See e.g. APCO Comments at 40.

<sup>117</sup> NPSTC Reply Comments at 10.

for the D Block because, among other reasons, regional licenses would permit participation by smaller providers, who may be unable to compete on a nationwide scale, but may have the resources to build regional networks that could be leveraged to rapidly deploy a nationwide system.<sup>118</sup> US Cellular recommends that the Commission adopt geographic areas that align with the “55 National Public Safety Planning Advisory Committee (“NPSPAC”) regions.”<sup>119</sup> US Cellular argues that these regions are of similar size to MEAs and “with over two decades of experience in meeting the wireless needs of state and local public safety authorities through [NPSPAC] regional committees operating pursuant to a national plan and FCC order, there are also distinct advantages in aligning D Block licenses with the NPSPAC.”<sup>120</sup> US Cellular and RTG also contend that smaller license areas could lead to more rapid deployment of public safety communications networks in rural areas.<sup>121</sup>

62. TeleCommUnity, a national association of local governments, and Charlotte, North Carolina, Houston, Texas, and Montgomery County, Maryland (TeleCommUnity), contends that there are strong arguments for allocating regional licenses, for the D Block, as well as the single, nationwide license approach.<sup>122</sup> The New York City Police Department (NYPD) and the City of Philadelphia (Philadelphia) contend that the Commission should adopt an approach that permits local public safety agencies to develop their networks that would then interconnect with other local public safety agencies.<sup>123</sup> These entities argue that a single, nationwide license could impede the development of their local public safety networks.<sup>124</sup> Coverage Co. and Space Data Corp. ask the Commission to adopt an approach that assigns one license for urban or more populated areas and another license for rural or less populated areas.<sup>125</sup> Other entities, such as Google and Qualcomm, do not appear to favor a single, nationwide license or a multiple regional license approach. They are more concerned that the Commission establishes a public safety broadband network that is interoperable as soon as practicable.<sup>126</sup>

63. Discussion. We tentatively conclude that we should offer the D Block at auction as both a single, nationwide license and as regional licenses. We propose that the regional geographic areas would be comprised of the 55 700 MHz RPC regions,<sup>127</sup> and three additional regions, and to refer to these

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<sup>118</sup> AT&T Comments at 24-25; Verizon Wireless Comments at 29-31; Verizon Wireless Reply Comments at 11; MetroPCS Comments at 20; US Cellular Comments at i, 15-16; RTG Comments at ii, 1; NTCH Comments at 9-10; Testimony of William J. Andrie, Jr. Northrop Grumman Information Technology FCC *En Banc* Hearing, New York, July 30, 2008 at 2.

<sup>119</sup> US Cellular Comments at 2. US Cellular later made an *ex parte* presentation in which it argued that the Commission should license the D Block through geographic areas that followed state geographical boundaries. See Letter from Warren G. Lavey, on behalf of US Cellular, to Marlene H. Dortch, Secretary, WT Docket No. 06-150, filed Aug. 29, 2008, Attachment at 3.

<sup>120</sup> US Cellular Comments at i. See also AT&T Reply Comments at 9; City of Philadelphia Reply Comments at 6-7 & nn. 13, 16.

<sup>121</sup> RTG Comments at ii, 4; US Cellular Comments at 2.

<sup>122</sup> TeleCommUnity Comments at 13-14.

<sup>123</sup> NYPD Reply Comments at 4-5; Philadelphia Reply Comments at 8.

<sup>124</sup> NYPD Reply Comments at 7-14; Philadelphia Reply Comments at 5-8.

<sup>125</sup> Coverage Co. Comments at 2; Space Data Corp. Comments at 2-3, 12.

<sup>126</sup> Google Comments at 3; Qualcomm Comments at 8.

<sup>127</sup> Although some commenters propose the use of NPSPAC regions for licensing, we tentatively find it more appropriate to use the Regional Planning Committee (RPC) regions, which are largely but not entirely identical. We note that the NPSPAC regions were established in connection with the 800 MHz public safety spectrum. The term “NPSPAC” is an acronym for the National Public Safety Planning Advisory Committee, which was established by (continued....)

58 regions as PSRs for D Block licensing purposes.<sup>128</sup> The three additional regions will cover (1) the Gulf of Mexico; (2) the Territory of Guam (Guam) and the Commonwealth of Northern Mariana Islands (Northern Mariana Islands); and (3) the Territory of American Samoa (American Samoa), and will be identical to the current Economic Area (EA) licensing areas for those same regions.

64. As we explain further below, we find that both nationwide and PSR area licenses have advantages that could help achieve the public interest goal of establishing a commercially viable interoperable public safety broadband network on a nationwide basis. Further, while offering the D Block on a regional basis raises the risk of unsold areas, offering only a single, nationwide license may increase the risk that there are no bids on the D Block spectrum at all. Accordingly, to provide the greatest likelihood of success in offering new licenses for the D Block spectrum with a public/private partnership condition, we propose to permit entities to bid on both nationwide and regional licensing options and to allow auction results to determine on which geographic area basis the D Block will ultimately be licensed pursuant to auction rules and procedures that we explain elsewhere in this Third Further Notice.

65. *Nationwide Option.* We tentatively conclude that one of the D Block geographic license area options that parties should be able to bid upon is a single, nationwide license. We propose to offer a nationwide D Block license because the record in this proceeding reaffirms that the Commission can achieve its goals for the public safety broadband network through this type of license.<sup>129</sup> In particular, one of the Commission's primary goals for the authorization of the D Block is to "address a vitally important problem: promoting interoperability, on a nationwide basis, for public safety communications."<sup>130</sup> The record in response to the *Second Further Notice* supports the Commission's

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the Commission in 1986 to advise the Commission on rules for the 821-824 MHz/866-869 MHz band. See Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems Amendment of Parts 2, 15, and 90 of the Commission's Rules and Regulations to Allocate Frequencies in the 900 MHz Reserve Band for Private Land Mobile Use Amendment of Parts 2, 22 and 25 of the Commission's Rules to Allocate Spectrum for, and to Establish Other Rules and Policies Pertaining to the Use of Radio Frequencies in a Land Mobile Satellite Service for the Provision of Various Common Carrier Services, GEN Docket No. 84-1231 RM-4812, GEN Docket No. 84-1233 RM-4829, GEN Docket No. 84-1234, *Report and Order*, 2 FCC Rcd at 1825 ¶ 46 (1986). The 821-824 MHz/866-869 MHz band was eventually licensed on a regional basis with the resulting regions designated as NPSPAC regions. However, the initial rules governing the 700 MHz public safety spectrum, which included the regional approach governing a portion of that spectrum, were established in a separate proceeding. See Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, WT Docket No. 96-86, *First Report and Order and Third Notice of Proposed Rulemaking*, 14 FCC Rcd 152 (1998) (*700 MHz Public Safety First Report and Order and Third Notice*). We tentatively find that the 700 MHz regions are the more appropriate regional basis to use in the instant proceeding. As noted above, the 700 MHz regions are almost, but not quite, identical to the 800 MHz NPSPAC regions. Although the NPSPAC regional boundaries were used as the initial basis for the 700 MHz public safety regions, see *id.* at 263, Appendix D (List of Regions), two of the regions have since been modified. See Public Notice, "Public Safety 700 MHz Band – General Use Channels Approval of Changes to Regional Planning Boundaries of Michigan and Connecticut," 16 FCC Rcd 16359 (2001). Our proposal would thus license the D Block in accordance with these regional boundaries as modified for Connecticut and Michigan. As for terminology, because the NPSPAC was not involved in the 700 MHz proceeding, it would be a misnomer to identify these 700 MHz geographic areas as NPSPAC regions. It is more accurate to refer to the regions as RPC regions because the spectrum allocation in these areas is governed by the RPCs. See 47 C.F.R. § 90.531.

<sup>128</sup> See Appendix A.

<sup>129</sup> *Second Report and Order*, 22 FCC Rcd at 15420 ¶ 369. Thus, the license will cover the 50 states, the Gulf of Mexico, and the territories.

<sup>130</sup> *Second Further Notice*, 23 FCC Rcd at 8051 ¶ 5; see also *Second Report and Order*, 22 FCC Rcd at 15419 ¶ 365. In addition, in the *700 MHz Public Safety Eighth Notice* adopted in March 2006, the Commission emphasized its commitment "to ensuring that emergency first responders have access to reliable and interoperable (continued....)"

previous determination that interoperability is a critical need for the public safety broadband network and that assigning the D Block to a single, nationwide licensee may help to facilitate achieving nationwide interoperability both within and between jurisdictions. We note that the majority of public safety agencies assert that a single, nationwide license is the best way to achieve an interoperable network.<sup>131</sup> Although we tentatively find that it is possible to achieve interoperability between regional networks, a nationwide license would likely simplify the task of ensuring interoperability and avoid problems in its implementation. For example, it would eliminate the need for technology coordination, roaming arrangements, and interconnection arrangements between different regional networks.

66. Licensing the D Block on a nationwide basis could also help to achieve the other goals that the Commission has for the public safety broadband network, *i.e.*, that it be cost effective, spectrally efficient, flexible and employ an advanced IP-based network.<sup>132</sup> A single, nationwide license may provide opportunities for cost savings through elimination of redundant equipment (*e.g.*, mobile base station deployments in the event of natural disasters), processes (billing, etc.) or staff (*e.g.*, public safety support), and greater economies of scale for network equipment or handsets.<sup>133</sup> These cost savings might enhance the ability of the D Block licensee to rapidly build the public safety broadband network in rural, expensive-to-serve, less populated areas. We therefore tentatively conclude that the economies of scale that a commercial entity could achieve through a single, nationwide license could promote the rapid deployment of an advanced nationwide public safety broadband network.

67. In addition, a single, nationwide license could facilitate coordination between the D Block licensee, the Public Safety Broadband Licensee, and the public safety agencies that use the network. As discussed elsewhere in this Third Further Notice, the public/private partnership concept requires the D Block licensee to establish an NSA with the Public Safety Broadband Licensee and, thereafter, coordinate with the Public Safety Broadband Licensee to ensure that the network effectively serves the interests of the public safety community. The coordination scheme envisioned for the D Block could be particularly efficient if there were only one licensee required to coordinate and negotiate with the Public Safety Broadband Licensee and local public safety agencies.

68. Some wireless service providers argue that the single, nationwide license will not work because, in their opinion, no single entity would find it commercially viable to develop a nationwide public safety communications network with the technical requirements and other rules that the Commission had imposed, in the *Second Report and Order*, on the D Block.<sup>134</sup> As we discuss in more detail, elsewhere, we have made substantial changes to the technical specifications and performance requirements that should help make the single, nationwide license more commercially viable. These policies should ease the burdens on a single, nationwide D Block licensee.

69. *Public Safety Region Option.* We tentatively conclude that we should revise our rules to also provide the option of regional geographic area licensing of the D Block on the basis of 58 PSRs, 55 regions of which would correspond to the 55 RPC regions, and which would include three additional regions covering (1) the Gulf of Mexico; (2) Guam and the Northern Mariana Islands; and (3) American

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communications.<sup>131</sup> *700 MHz Public Safety Eighth Notice*, 21 FCC Rcd at 3682 ¶ 31; *see also*, *Second Further Notice*, 23 FCC Rcd at 8051 ¶ 4; *Second Report and Order*, 22 FCC Rcd at 15420 ¶ 369; *700 MHz Further Notice*, 22 FCC Rcd at 8156 ¶ 253.

<sup>131</sup> *See, e.g.*, APCO Comments at 40; IMSA et al. Comments at 12; NATOA, et al. Comments at 10.

<sup>132</sup> *Second Report and Order*, 22 FCC Rcd at 15420 ¶ 369.

<sup>133</sup> *See Second Report and Order*, 22 FCC Rcd at 15298, 15324 ¶¶ 20, 82 (explaining how larger geographic service areas permit service providers to establish economies of scale).

<sup>134</sup> AT&T Comments at 7-8; Verizon Wireless Comments at 7-8, 24-31.

Samoa.<sup>135</sup> As we explain further below, PSR licensees could lead to a rapid deployment of the public *safety broadband network that is tailored to respond to the public safety communications needs of* particular regions.

70. Our proposal to permit licensing of the D Block on a regional basis is based on several factors. Section 309(j) of the Communications Act instructs that, in designing competitive bidding systems, the Commission should consider the dissemination of licenses among a wide variety of applicants when that consideration would serve the public interest.<sup>136</sup> Regional licensing could allow smaller commercial entities that do not have the resources to acquire a nationwide license and meet nationwide performance requirements to participate in bidding for D Block licenses, thereby increasing the chances of a successful public/private partnership for at least the majority of the nation. In addition, regional licensing could lead to enhanced build-out and faster deployment to less populated, rural areas. Those entities interested in a larger geographic footprint can bid on, and if successful, aggregate multiple PSR regional licenses. The record in response to the *Second Further Notice* demonstrates that nearly all nationwide carriers and several regional carriers, which filed comments, support licensing on a regional basis.<sup>137</sup> As we explain elsewhere, in order to ensure that authorizing the D Block through multiple, regional licenses will achieve nationwide interoperability, we have proposed roaming and certain other interoperability requirements for D Block licenses. In order to reduce the possibility that regional licensing of the D Block might result in large areas that are unserved by the public safety broadband network, we tentatively conclude that an auction of the D Block spectrum must result in winning D Block license bidders with licenses covering at least 50 percent of the nationwide population or the results of the auction will be void.<sup>138</sup>

71. In addition, regional D Block licensees could be particularly responsive to the unique needs of state, regional, and local public safety agencies. Regional licensees could coordinate with local public safety entities and ensure that public safety communications are tailored to meet unique local needs in particular geographic areas. PSR licensees may, for example, take into account regional differences in terrain and public safety needs in determining how to set up and operate the system, which could be more cost effective in certain respects and better suited to regional needs than a one-size fits-all system. PSR licenses may also be more desirable because the assignment of a single, nationwide, D Block license may increase risks of disruption for public safety entities in the event the single nationwide operator is commercially unsuccessful. Having regional licensees, with license areas mostly following state jurisdictional boundaries, may also address certain concerns in the record that the development of the nationwide public safety broadband network should not impede the existing networks that some local agencies have spent substantial resources deploying.<sup>139</sup>

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<sup>135</sup> See Appendix A.

<sup>136</sup> 47 U.S.C. § 309(j)(3)(B); Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *First Report and Order*, 15 FCC Rcd 476, 500 ¶ 57 (2000).

<sup>137</sup> AT&T, Inc., (AT&T) Comments at 24-25; Verizon Wireless Comments at 29-31; Verizon Wireless Reply Comments at 11; Metro PCS Comments at 20; US Cellular Comments at i, 15-16; Rural Telecommunications Group, Inc. (RTG) Comments at ii, 1; NTCH, Inc., (NTCH) Comments at 9-10; Testimony of William J. Andrie, Jr. Northrop Grumman Information Technology FCC *En Banc* Hearing, New York, July 30, 2008 at 2. Among the carriers offering nationwide service plans, who filed comments in this proceeding, only Sprint Nextel supports nationwide licensing. See Sprint Nextel Comments at 11.

<sup>138</sup> See Letter from Warren G. Lavey, on behalf of US Cellular, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 06-150, filed July 28, 2008, Attachment at 9 (suggesting that the Commission should set a minimum population threshold in determining if the auction results for the D Block should stand).

<sup>139</sup> See, generally, District Comments; see also Prepared Testimony of John J. Farmer, Former Attorney General, New Jersey; Senior Counsel, 9/11 Commission, at 3, FCC *En Banc* Hearing (July 30, 2008).

72. Assigning the D Block through PSR licenses that are geographically aligned with the 55 RPC regions could further enhance the responsiveness of the PSR licensees to the public safety communications needs of their specific geographic regions and facilitate the development of an interoperable public safety broadband network. The Commission created the RPC regions for 700 MHz public safety general use spectrum to maximize the efficiency of public safety's use of this spectrum and to foster the accommodation of a wide variety of localized public safety communications requirements in different areas of the Nation. Creating regional D Block licenses whose boundaries correspond with those of the RPC regions should facilitate interaction between the PSR licensees and the existing RPCs. We anticipate that these regional entities have considerable institutional knowledge about the communications needs and concerns of public safety entities within their jurisdictions. PSR licensees could coordinate with them for their respective licensing area to learn about any public safety communications challenges or needs that might be specific to the particular region. RPCs might also help the Public Safety Broadband Licensee and PSR licensees negotiate the build-out schedule, fees, and other terms of their respective NSAs that would be tailored for a particular PSR region. RPCs could also share with PSR licensees approaches towards establishing inter-regional interoperability that have been more successful than others.<sup>140</sup>

73. *License Partitioning and Disaggregation.* We tentatively conclude that it would not serve the public interest to change the current rule governing D Block partitioning and disaggregation, and thus to continue prohibiting any partitioning and disaggregation of a D Block license. We seek comment on this conclusion.

74. *Other Geographic Area Proposals.* We tentatively conclude that it would not serve the public interest to split the D Block into one license for a high-population density area and a second license covering low-population density, rural areas, as Coverage Co. and Space Data request.<sup>141</sup> Coverage Co. and Space Data's proposals do not specify the boundaries of the geographic areas that the two licenses would cover, which could present uncertainties for potential bidders and lead to disputes. In addition, there is a substantial question about the commercial viability of these two-license approaches. Coverage Co. and Space Data do not appear to argue, and the arguments they make do not demonstrate, that their two-license proposals are more commercially viable than the regional approach we propose. Also, the record does not indicate that commenters, other than Coverage Co. and Space Data, support these specific two-license proposals. Based on the record and the unique characteristics of this proceeding, such as the important obligations of the public/private partnership licensees, the Commission would need a stronger record, before deciding that it should adopt a geographic area licensing scheme that is significantly different from the schemes the Commission has employed in the past.<sup>142</sup>

75. Finally, we tentatively conclude that it would not serve the public interest to offer license areas that are smaller than PSRs in the reauction of the D Block. Although the record indicates that some

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<sup>140</sup> See AT&T Reply Comments at 9 (arguing that, if the Public/Private Partnership is able to take advantage of the organizational structure already in place among the RPCs, "the RPCs will facilitate interoperability and coordination between adjacent regions and public safety agencies, while ensuring that local public safety users have a voice in the design and functionality of the services offered over the network.").

<sup>141</sup> Coverage Co. Comments at 2; Space Data Comments at 2, 13-15; Space Data Reply Comments at 2. Coverage Co. is a provider of software-defined radio (SDR) technology services and it claims that its technology would allow a commercial wireless network to operate on both CDMA and GSM systems. Coverage Co. Comments at 4-5. Space Data uses a "balloon-based 'near space' communications system" to provide "wireless services in the South Central United States." Space Data Comments at 4.

<sup>142</sup> Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Twelfth Report*, 23 F.C.C.R. 2241, 2286 ¶ 97 (2008) ("*Twelfth Report*").

entities have an interest in the Commission assigning the D Block by offering 493 BTAs,<sup>143</sup> 176 EAs,<sup>144</sup> and 736 CMA licenses,<sup>145</sup> smaller license areas may make it more difficult to achieve nationwide interoperability. Assigning hundreds of smaller license areas could also exacerbate coordination issues that might arise among the D Block licensees, the Public Safety Broadband Licensee, and public safety agencies that would be involved with the policies and operation of the network. Moreover, license areas smaller than the PSRs might increase the possibility that some license blocks will not be sold in the reauction.

## 2. Requirements for the Shared Wireless Broadband Network

### a. Spectrum Use Issues

#### (i) Combined Spectrum Use

76. Background. In the *Second Report and Order*, we determined that promoting commercial investment in the build-out of a shared network infrastructure for both commercial and public safety users through the 700 MHz Public/Private Partnership would address “the most significant obstacle to constructing a public safety network—the limited availability of public funding.”<sup>146</sup> We concluded that providing for a shared infrastructure using the D Block and the public safety broadband spectrum would help achieve significant cost efficiencies, allow public safety agencies to take advantage of off-the-shelf technology, provide the public safety community with access to an additional 10 megahertz of broadband spectrum during emergencies, and provide the most practical means of speeding deployment of a nationwide, interoperable, broadband network for public safety service by providing all of these benefits on a nationwide basis.<sup>147</sup> At the same time, we pointed out that the 700 MHz Public/Private Partnership would provide the D Block licensee with rights to operate commercial services in the 10 megahertz of public safety broadband spectrum on a secondary, preemptible basis, which would both help to defray the costs of build-out and ensure that the spectrum is used efficiently.<sup>148</sup>

77. In the *Second Further Notice*, we sought comment on whether, to provide the D Block licensee with appropriate flexibility to achieve an efficient and effective implementation of the 700 MHz Public/Private Partnership obligations, we should amend the rules to clarify that the D Block licensee may construct and operate the shared wireless broadband network using the entire 20 megahertz of D Block spectrum and public safety broadband spectrum as a combined, blended resource.<sup>149</sup> In particular, we sought comment on whether, in designing and operating the shared network, the 10 megahertz of D Block spectrum and the 10 megahertz of public safety broadband spectrum may be combined, in effect, into a

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<sup>143</sup> AT&T Comments at 24 (recommending EAs and CMAs as options for the geographic area license); Coleman Bazelon Comments at 24 (CMA licenses); RTG Comments at ii, 5 (requesting CMAs); Wirefree Comments at 12-14 (requesting CMAs); NTCH Comments at 11 (requesting BTAs); *see also*, In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, *Fifth Report*, FCC 08-88, 2008 WL 2404499 (rel. June 12, 2008), at ¶ 52 (indicating there are 493 BTAs).

<sup>144</sup> *See* “Auction of 700 MHz Band Licenses Scheduled for January 16, 2008; Comment Sought on Competitive Bidding Procedures For Auction 73,” *Public Notice*, FCC Rcd 15004 (WTB 2007) (indicating there are 176 EAs).

<sup>145</sup> *See* “Auction of 700 MHz Band Licenses Scheduled for January 16, 2008; Comment Sought on Competitive Bidding Procedures For Auction 73,” *Public Notice*, FCC Rcd 15004 (WTB 2007) (indicating there are 736 CMAs).

<sup>146</sup> *Second Report and Order*, 22 FCC Rcd at 15431 ¶ 396.

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

<sup>149</sup> *Second Further Notice*, 23 FCC Rcd at 8077 ¶ 80.

single and integrated 20 megahertz pool of fungible spectrum.<sup>150</sup> This pool of spectrum could then 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.<sup>151</sup> These assignments would be permissible so long as the network provides commercial and public safety users with service that is consistent with the respective capacity and priority rights of the D Block license and Public Safety Broadband License and with our rules.<sup>152</sup> We sought comment on whether permitting the combined use of spectrum in this fashion would provide for a more efficient and effective use of spectrum.<sup>153</sup> We also sought comment on whether such a combined use would be consistent with the different rights and obligations associated with the D Block license and the Public Safety Broadband License and whether it would be in the public interest to allow such use.<sup>154</sup> We asked whether permitting such combined use would be consistent with the requirements of Sections 337(a) and (f) and the Commission rules allotting specific frequencies for use by the Public Safety Broadband Licensee and the D Block licensee.<sup>155</sup>

78. Comments. In response to *Second Further Notice*, we received broad support for clarifying that the D Block licensee may construct and operate the shared wireless broadband network using the entire 20 megahertz of D Block spectrum and public safety broadband spectrum as a combined, blended resource.<sup>156</sup> These commenters note that allowing the combined flexible use of spectrum will promote efficient use of the spectrum and make the D Block license more commercially attractive while facilitating priority access and preemption.<sup>157</sup> Supporters of this approach included members of the public safety community.<sup>158</sup> In addition, Google and Alcatel Lucent note that this approach is consistent with the Communications Act.<sup>159</sup>

79. Discussion. Based on the record, we tentatively conclude that a D Block licensee may construct and operate the shared wireless broadband network using the entire 20 megahertz of D Block spectrum and public safety spectrum as a combined, blended resource. That 20 megahertz of spectrum may be assigned to users without regard to whether a public safety user is assigned frequencies in the D Block or a commercial user is assigned frequencies in the public safety broadband spectrum, so long as 50 percent of the capacity available from the combined 20 megahertz of spectrum is assigned to the public safety users and the other 50 percent to the commercial users, consistent with the respective capacity and priority rights of the D Block license and the Public Safety Broadband License and with our rules.<sup>160</sup>

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<sup>150</sup> *Id.*

<sup>151</sup> *Id.*

<sup>152</sup> *Id.*

<sup>153</sup> *Id.* at 8077 ¶ 81.

<sup>154</sup> *Id.*

<sup>155</sup> *Id.*

<sup>156</sup> ALU Comments at 8-9; Google Comments at 4-5; Ericsson Comments at 17, 24 n.56; Hypres Comments at 7; Motorola Comments at 10-11; SouthernLINC Reply Comments at 9-10. *But see* TE M/A-COM Comments at 8 (arguing against a combined network).

<sup>157</sup> *See* ALU Comments at 8; Google Comments at 4-5; Ericsson Comments at 24 n.56.

<sup>158</sup> NRPC Comments at 6; APCO Comments at 27.

<sup>159</sup> Google Comments at 4-5; ALU Comments at 8-9.

<sup>160</sup> *Second Further Notice*, 23 FCC Rcd at 8077 ¶ 80.

80. We agree with the commenters<sup>161</sup> who conclude that permitting the combined use of spectrum in this fashion provides for a more efficient and effective use of spectrum and provides further flexibility for a D Block licensee to use all available wireless broadband technologies to build and operate the network and thus promote our ultimate goal of making available a nationwide interoperable broadband network for public safety users. If given the flexibility of undivided spectrum, a D Block licensee can use the best available network management technologies to allocate and prioritize users efficiently across the full 20 megahertz of spectrum,<sup>162</sup> thereby increasing throughput and capacity over what can be achieved with two separate 10 megahertz networks.<sup>163</sup> Further, we expect that by focusing its resources on a blended network design rather than a network that must carefully segregate different services into separate frequency bands, a D Block licensee should also be able to conserve costs. This improved flexibility, efficiency, and cost should make the license more attractive to potential bidders.<sup>164</sup>

**(ii) Priority Public Safety Access to Commercial Spectrum  
During Emergencies**

81. Background. In the *Second Report and Order*, we required the D Block licensee to provide the Public Safety Broadband Licensee with priority access during emergencies to the spectrum associated with the D Block license (in addition to the 700 MHz public safety broadband spectrum).<sup>165</sup>

82. In the *Second Further Notice*, we sought comment on whether we should continue to require the D Block licensee to provide the Public Safety Broadband Licensee with priority access during emergencies to the spectrum associated with the D Block license.<sup>166</sup> We invited comment on whether this obligation is essential to ensure that the network capacity will meet public safety wireless broadband needs.<sup>167</sup> We asked, alternatively, whether removing the obligation could significantly improve the chances that this proceeding will succeed in achieving our goal of making available to public safety users a nationwide, interoperable, broadband network that incorporates the greater levels of availability, robustness, security, and other features required for public safety services.<sup>168</sup> We sought further comment on whether, if we continue to require that the D Block licensee provide the Public Safety Broadband Licensee with priority access during emergencies to the spectrum associated with the D Block license, we should provide more clarity on the circumstances that would constitute an "emergency" for this purpose.<sup>169</sup>

83. Comments. In response to *Second Further Notice*, we received comments generally supporting the idea of providing public safety entities with some additional spectrum capacity for emergency needs,<sup>170</sup> but parties diverged on the extent of such access. While the public safety

<sup>161</sup> ALU Comments at 8; Google Comments at 4-5; NRPC Comments at 6; Ericsson Comments at 17-18; Hypres Comments at 7; SouthernLINC Reply Comments at 9-10.

<sup>162</sup> See ALU Comments at 8.

<sup>163</sup> See Ericsson Comments at 17.

<sup>164</sup> See Google Comments at 4; SouthernLINC Reply Comments at 9-10.

<sup>165</sup> *Second Report and Order*, 22 FCC Rcd at 15441-42 ¶¶ 426-27.

<sup>166</sup> *Second Further Notice*, 23 FCC Rcd at 8079 ¶ 85.

<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *Id.* at 8079-80 ¶ 86.

<sup>170</sup> PSST Comments at 32; Seybold Comments at 2-3; RPC 33 Comments at 10; AASHTO Comments at 13; NATOA *et al.* Comments at iv; SDR Forum Comments at 10, 16; PGCC Comments at 12; Televate Comments at 11; NTCH Comments at 4; AT&T Reply Comments at 18; NPSTC Comments at 12; Ericsson Comments at 25; (continued....)

community generally agrees that public safety users should have at least some priority access in emergencies to the spectrum associated with the D Block,<sup>171</sup> they are divided on whether geographic and time limits should be established.<sup>172</sup> PSST argues that “public safety priority access during emergency situations should be limited to 70% of total network capacity [or 40% of the D Block capacity] and that public safety preemption rights should not exceed 50% of the network capacity.”<sup>173</sup> APCO proposes avoiding the difficulties in defining the contours of emergency priority access by allowing both public safety and commercial users to take advantage of any available channels in the combined 20 megahertz spectrum when traffic is low, but restricting each set of users to 10 megahertz during periods of high traffic.<sup>174</sup> APCO argues that public safety users should have priority access to all 20 megahertz only in rare circumstances.<sup>175</sup> We note that several commenters suggest the possibility of using technology to dynamically prioritize signals throughout the network.<sup>176</sup>

84. Other commenters argue that unlimited emergency priority access to the capacity set aside for commercial use would undermine the commercial viability of the network and the success of the Public/Private Partnership.<sup>177</sup> AT&T and Alcatel-Lucent recommend that we model that priority access after the Department of Homeland Security’s Wireless Priority Service,<sup>178</sup> which allows government officials to contract with CMRS providers for priority telecommunications services.<sup>179</sup> With regard to

(Continued from previous page)

NATO et al. Reply Comments at 11; Verizon Wireless Reply Comments at 7; *But see* Bazelon Comments at 1-2, 22 (arguing that a priority access requirement would inappropriately diminish the value of the D Block for commercial entities, thereby reducing the likelihood of a winning bid as well as proceeds to use to support a public safety network).

<sup>171</sup> PSST Comments at 32; Seybold Comments at 2-3; RPC 33 Comments at 10; AASHTO Comments at 13; NATO et al. Comments at iv; SDR Forum Comments at 10, 16; PGCC Comments at 12; Televate Comments at 11; NTCH Comments at 4; AT&T Reply Comments at 18; NPSTC Comments at 12; Ericsson Comments at 25; NATO et al. Reply Comments at 11; Verizon Wireless Reply Comments at 7; *But see* Bazelon Comments at 1-2, 22 (arguing that a priority access requirement would inappropriately diminish the value of the D Block for commercial entities, thereby reducing the likelihood of a winning bid as well as proceeds to use to support a public safety network).

<sup>172</sup> *See* RPC 33 Comments at 17-18 (supporting limitations); Wireless RERC Comments at 12 (same). *But see* AASHTO Comments at 12-13 (noting that any limitations could hinder safety operations in the event of an emergency).

<sup>173</sup> PSST Reply Comments at ii, 7-8. PSST stated in its initial comments that “it is reasonable to limit priority access for public safety to 70% of overall network capacity of the SWBN, or just 40% of the D Block spectrum capacity.” PSST Comments at 33.

<sup>174</sup> APCO Comments at 27-28. *But see* NATO et al. Reply Comments at 11.

<sup>175</sup> APCO Comments at 27-28.

<sup>176</sup> SDR Forum Comments at 16, 25, 27; AT&T Comments at 13; NPSTC Comments at 47-48.

<sup>177</sup> Leap Wireless Comments at 13-14 (arguing that public safety users should be allowed priority access to only 50% of available network capacity, “with no other preemption requirements on the network”); Verizon Wireless Comments at 9 (“providing priority access to public safety users on a preemptive basis reduces the value of the network to their commercial counterparts”); Motorola Comments at 8; *but see* Sprint Nextel Comments at 14-15 (proposing that the D Block auction winner offer “near real-time prioritization,” under which the D Block licensee moves “all commercial traffic off network within ten minutes of receiving a call from authorized public safety officials”) *But see* Verizon Wireless Reply Comments at 7 (noting that reducing priority access to 50% of the network “would frustrate the very purpose of building a new dedicated public safety network.”).

<sup>178</sup> *See* <http://wps.ncs.gov/>.

<sup>179</sup> AT&T Comments at 13; *see also* ALU Comments at 9-10; AT&T Reply Comments at 18 n.59.

geographic limitations, Ericsson argues "that priority access should be limited to specific geographic areas affected by serious emergencies, to avoid jeopardizing the commercial viability of the 700 MHz Public/Private Partnership, and that priority access should be properly limited to the area directly affected by the emergency."<sup>180</sup> As to bandwidth limitations, some propose that at least 50 percent of the capacity be prioritized for public safety use.<sup>181</sup>

85. Several commenters also argue that the Commission should define the specific circumstances that constitute an "emergency" before conducting an auction,<sup>182</sup> suggesting several methods to achieve this goal. Others argue that the parties should decide this issue for themselves,<sup>183</sup> and one commenter argues that emergencies should be declared only by senior levels of state or local government.<sup>184</sup> Some commenters agree that the specific situations listed in the *Second Further Notice*<sup>185</sup> could be considered an emergency.<sup>186</sup>

86. Discussion. Based on the record, we tentatively conclude that emergency access to the D Block commercial capacity should be mandated only in the event of an "emergency," as that term was defined in the *Second Further Notice*, specifically:

- The declaration of a state of emergency by the President or a state governor.
- The issuance of an evacuation order by the President or a state governor impacting areas of significant scope.
- The issuance by the National Weather Service of a hurricane or flood warning likely to impact a significant area.
- The occurrence of other major natural disasters, such as tornado strikes, tsunamis, earthquakes, or pandemics.
- The occurrence of manmade disasters or acts of terrorism of a substantial nature.
- The occurrence of power outages of significant duration and scope.

<sup>180</sup> Ericsson Comments at 23.

<sup>181</sup> Motorola Comments at 10. Ericsson further argues that "the priority access and preemption for public safety can be applied on the entire 20 MHz" and that "3GPP standards provide automatic methods for providing such priority access and preemption." Ericsson Comments at 24. *But see* CEA Comments at 3 ("the Commission should limit public safety's priority access to D Block spectrum in emergencies to 50 percent of the commercial D Block capacity.")

<sup>182</sup> *See* AT&T Comments at 13; Qualcomm Comments at 10-11; Google Comments at 6-7; NRPC Comments at 9-10; Bazelon Comments at 1; Wireless RERC Comments at 11; APCO Comments at 26. *But see* Leap Wireless Comments at 13-14. RPC 33 proposes that an emergency exists anytime lives or "significant property" are at risk, but that the decision should be made locally, rather than by a national board. RPC 33 Comments at 17.

<sup>183</sup> Qualcomm Comments at 10-11. Televate similarly argues that commercial bidders should submit before the auction proposals that state under what conditions they will allow priority access to their networks. Televate Comments at 11. NPSTC agrees that the Commission should define certain circumstances that would constitute an emergency "after consultation with the PSBL and D Block licensee, and in circumstances the PSBL has defined and Commission approves prior to the D Block auction." NPSTC Comments at 12-13.

<sup>184</sup> NPSTC Comments at 12-13.

<sup>185</sup> *See Second Further Notice*, 23 FCC Rcd at 8079-80 ¶ 86.

<sup>186</sup> Ericsson Comments at 23-24; California Comments at 6. The Wireless RERC urges, however, that the terms "significant" and "substantial," as used in the *Second Further Notice*, be further clarified or deleted from the descriptions of those situations. Wireless RERC Comments at 12.

- The elevation of the national threat level to either orange or red for any portion of the United States, or the elevation of the threat level in the airline sector or any portion thereof, to red.

87. We tentatively conclude that for the first two conditions and when the national or airline sector threat is set to red, the D Block licensee(s) must provide public safety users priority access<sup>187</sup> to, but not preemptive use of, up to 40 percent of the commercial D Block spectrum capacity (*i.e.*, 2 megahertz in each of the uplink and downlink blocks), assuming the full public safety broadband block spectrum capacity is being used, for an aggregate total of 14 megahertz of overall network capacity.<sup>188</sup> For all other emergencies listed above, the D Block licensee(s) must provide priority access to, but not preemptive use of, up to 20 percent of the commercial spectrum capacity (*i.e.*, 1 megahertz in each of the uplink and downlink blocks). Furthermore, under either scenario, the right to emergency-based priority access must be limited to the time and geographic scope of the emergency. To trigger emergency-based priority access, the PSBL will request, on behalf of the impacted public safety agencies, that the D Block licensee provide such access. Priority access requests initiated by the PSBL will cover a 24-hour time period, and must be reinitiated by the PSBL for each 24-hour time period thereafter that the priority access is required. In the event that the D Block licensee and the PSBL do not agree that an emergency has taken place, the PSBL may ask the Defense Commissioner to resolve the dispute.

88. We expect that the instances under which emergency-based priority access would be triggered under the definition we tentatively propose above will be relatively infrequent. Moreover, we agree generally with APCO that through responsible capacity management that permits public safety user groups to prioritize their regional and local use of the shared wireless broadband network, and which is embedded into the network prior to deployment, it will be possible to provide critical services using no more than the ten megahertz public safety portion of the shared wireless broadband network under virtually all but the rarest of circumstances.<sup>189</sup> At the same time, our proposed approach should continue to guarantee additional network capacity to meet public safety wireless broadband needs in the most serious emergencies. We note, for example, that both of the circumstances cited by the PSST – the events of September 11, 2001, and Hurricane Katrina – would have met the standard we propose.<sup>190</sup>

89. In light of the fact that we expect public safety use of the priority access mechanism to be infrequent, we believe we should not require public safety users of priority access to pay an additional charge to the D Block licensee for such use over and above the basic monthly service charge discussed

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<sup>187</sup> To be clear, by “priority access,” we mean that the public safety user would be assigned the next available channel over a commercial user—*i.e.*, the public safety user would be placed at the top of the queue—and would not preempt a commercial call in progress.

<sup>188</sup> See PSST Comments at iii, 16 n.28, 33 (explaining that “it is reasonable to limit priority access for public safety to 70% of overall network capacity of the SWBN, or just 40% of the D Block spectrum capacity.”); PSST Reply Comments at ii (“public safety priority access during emergency situations should be limited to 70% of total network capacity and that public safety preemption rights should not exceed 50% of the network capacity.”).

<sup>189</sup> See APCO Comments at 28-29. APCO recommended that in circumstances under which “sector loading increases and service contention starts to occur, there [should be] a[n] immediate transition to a hard partition state” where commercial and public safety use of the shared wireless broadband network would revert to 50% of the paired spectrum (*i.e.*, where commercial users accessed only the ten megahertz of D Block spectrum and public safety users accessed only the ten megahertz of public safety broadband spectrum). The only instances in which this “hard partition” would be removed, allowing public safety users priority access some portion of the commercial D Block spectrum, would be pursuant to Presidential Order or “by any other existing means where government can seize control of commercial assets – a situation that rarely occurs, and would not be a specific impact to the [National Broadband Network] any more than any other commercial asset.” APCO Comments at 27.

<sup>190</sup> PSST Comments at 33. See “Declaration of National Emergency by Reason of Certain Terrorist Attacks,” <http://www.whitehouse.gov/news/releases/2001/09/20010914-4.html>.

elsewhere in this Third Further Notice. Although we stated in the *Second Report and Order* that separate fees for priority access could be specified in the NSA,<sup>191</sup> we did so based on a broader definition of priority access than the one we propose now. For example, the *Second Report and Order* permitted public safety preemption of ongoing commercial traffic,<sup>192</sup> which we would no longer allow. We also have proposed more specific criteria for defining emergencies that would trigger priority access rights and limitations on the duration of priority access. We therefore seek comment on our view that separate fees for priority access should not be allowed, or whether a separate fee structure would be appropriate to ensure that the D Block licensee can recover its costs for providing priority access.

90. We also expect that our proposed approach will significantly improve the chances that this proceeding will succeed in achieving our goal of making a nationwide, interoperable, broadband network available to public safety users. We appreciate that, to be viable, the commercial services offered on the D Block spectrum must be competitive with other commercial mobile services. Commercial viability could be adversely impacted if users of a D Block licensee's commercial services perceive that their service may be preempted or unavailable at the times when they most need to use it, while competing providers offer uninterrupted services. In clarifying the circumstances that would constitute an emergency, requiring priority access rather than preemption, and providing that only a portion of the commercial capacity will be subject to public safety priority access even in emergencies, we seek to minimize any diminution of the commercial value of the D Block spectrum. We tentatively find that this approach offers the best opportunity to create a commercially viable network that can satisfy the demands of public safety users. We seek comment on this approach.

91. *Commercial Operations in the Public Safety Spectrum on a Secondary Basis.* While we propose to modify the rules governing public safety's emergency access to commercial spectrum, we tentatively conclude that our rules for commercial access to public safety spectrum should remain the same, subject to our clarification regarding combined/blended use. As we explain below, the spectrum access permitted here and the conditions placed on the use of the spectrum are designed to ensure that any commercial use does not undermine the "principal purpose" of the services provided in this band "to protect the safety of life, health, or property," as required by Section 337.<sup>193</sup> And as we determined in the *Second Report and Order*, commercial operations on a secondary, preemptible basis will maximize the efficient use of the spectrum by permitting full use of the public safety broadband spectrum.<sup>194</sup> Further, providing the D Block licensee with the opportunity to offer commercial services on this spectrum, on a secondary basis, is an integral part of a viable framework for enabling the 700 MHz Public/Private Partnership to finance the construction of a nationwide, interoperable public safety broadband network.

**(iii) Consistency with Section 337 of the Communications Act**

92. Background. Section 337 of the Communications Act, as amended, required the Commission to allocate, from the 746-806 MHz Band, 24 megahertz for public safety services and 36 megahertz for "commercial use to be assigned by competitive bidding pursuant to section 309(j)."<sup>195</sup> Some commenters suggest that rules that would permit public safety use of spectrum allocated for commercial use or commercial use of public safety spectrum on a secondary basis would violate these requirements.<sup>196</sup>

<sup>191</sup> *Second Report and Order*, 22 FCC Rcd at 15448 ¶ 450.

<sup>192</sup> *Id.* at 15442 ¶ 428.

<sup>193</sup> 47 U.S.C. § 337(a)(1), (f)(1)(A).

<sup>194</sup> *Second Report and Order*, 22 FCC Rcd at 15437-38 ¶ 416.

<sup>195</sup> 47 U.S.C. § 337(a).

<sup>196</sup> *See, e.g.,* MetroPCS Comments at 14-16.

93. Discussion. In the *Second Report and Order*, we analyzed whether the 700 MHz Public/Private Partnership rules regarding the use of spectrum by the shared wireless broadband network were consistent with Section 337.<sup>197</sup> We found that Section 337(a)(1), requiring 24 megahertz for “public safety services,” does not prohibit us from permitting commercial operations on a secondary basis to the 10 megahertz of the 700 MHz public safety spectrum to facilitate the build-out of a public safety network.<sup>198</sup> We further found that Section 337(a)(2), which directs us to allocate 36 megahertz “for commercial use,” does not prohibit us from requiring the D Block licensee to provide public safety users with priority access to D Block license spectrum in an “emergency.”<sup>199</sup> We continue to find our analysis of these issues in the *Second Report and Order* persuasive. Further, because we are not proposing to modify the rules regarding secondary commercial use of the public safety spectrum, our reasoning and conclusions in the *Second Report and Order* regarding such use apply to our secondary use proposal here as well. While we do propose to modify public safety access to commercial spectrum in emergencies, such modifications would only reduce or clarify the scope of the emergency access. Because our conclusion in the *Second Report and Order* that such access was consistent with Section 337 rested in part on a finding that “emergency access to commercial spectrum would be triggered only in rare circumstances,” we find that the reasoning and conclusion applies even more strongly to the proposed emergency access rules. Accordingly, consistent with the *Second Report and Order*’s reasoning and conclusions, we conclude that our proposals regarding commercial use of public safety spectrum on a secondary, preemptible basis and public safety priority use of commercial spectrum capacity are consistent with the requirements of Section 337.

94. We find that our proposal to permit the D Block licensee to construct and operate the shared wireless broadband network using the entire 20 megahertz of D Block spectrum and public safety spectrum as a combined, blended resource is also consistent with Section 337. We note that Section 337(a)(1) provides us the authority to allocate 24 megahertz for public safety services “according to the terms and conditions established by the Commission.”<sup>200</sup> We have stated previously that “this phrase . . . afford[s] us broad discretion to impose conditions on the use of this spectrum to effectuate its optimal use by public safety . . .”<sup>201</sup> We conclude that permitting a blended use approach does in fact serve this purpose, given our finding above that blended use can provide a more efficient and effective use of the combined spectrum resource and thus promote our ultimate goal of making available an interoperable broadband network for public safety users nationwide. Indeed, given our conclusion that a 700 MHz network providing for shared use of commercial and public safety spectrum is itself legally permissible, we find it unlikely that Congress intended to preclude an efficient implementation of such sharing. We emphasize that, under a blended use approach, public safety users will still be guaranteed priority access to 10 megahertz of 700 MHz spectrum at all times consistent with the capacity to which they are entitled under the public safety broadband license. The blended use approach does not deprive either commercial or public safety users of the spectrum capacity that Congress directed to be allocated for their use, and is thus consistent with both the purpose and text of the statute.

**b. Technical Requirements of the Shared Wireless Broadband Network**

95. Background. In the *Second Report and Order*, we found that, to ensure a successful

<sup>197</sup> See *Second Report and Order*, 22 FCC Rcd at 15436-43 ¶¶ 412-430.

<sup>198</sup> See *id.* at 15437-41 ¶¶ 413-25.

<sup>199</sup> See *id.* at 15442 ¶ 429. We also found that imposing the 700 MHz Public/Private Partnership condition on the D Block did not prevent us from auctioning the license and was therefore consistent with the mandate under Section 337 that the spectrum be auctioned pursuant to Section 309(j). See *id.* at 15442-43 ¶ 430.

<sup>200</sup> 47 U.S.C. § 337(a)(1).

<sup>201</sup> *Second Report and Order*, 22 FCC Rcd at 14339 ¶ 419.

public/private partnership between the D Block licensee and the Public Safety Broadband Licensee, with a shared nationwide interoperable broadband network infrastructure that meets the needs of public safety, we must adopt certain technical network requirements.<sup>202</sup> Accordingly, among other requirements, we mandated that the network incorporate the following technical specifications:

- Specifications for a broadband technology platform that provides mobile voice, video, and data capability that is seamlessly interoperable across agencies, jurisdictions, and geographic areas. The platform should also include current and evolving state-of-the-art technologies reasonably made available in the commercial marketplace with features beneficial to the public safety community (*e.g.*, increased bandwidth).
- Sufficient signal coverage to ensure reliable operation throughout the service area consistent with typical public safety communications systems (*i.e.*, 99.7 percent or better reliability).
- Sufficient robustness to meet the reliability and performance requirements of public safety. To meet this standard, network specifications must include features such as hardening of transmission facilities and antenna towers to withstand harsh weather and disaster conditions, and backup power sufficient to maintain operations for an extended period of time.
- Sufficient capacity to meet the needs of public safety, particularly during emergency and disaster situations, so that public safety applications are not degraded (*i.e.*, increased blockage rates and/or transmission times or reduced data speeds) during periods of heavy usage. In considering this requirement, we expect the network to employ spectrum efficient techniques, such as frequency reuse and sectorized or adaptive antennas.
- Security and encryption consistent with state-of-the-art technologies.<sup>203</sup>

96. We required that the parties determine more specifically what these technical specifications would be and implement them through the NSA. In addition, we required that the parties determine and implement other detailed specifications of the network that the D Block licensee would construct.<sup>204</sup> We determined that allowing the parties to specify details, including the technologies that would be used, subject to approval by the Commission, would provide the parties with flexibility to evaluate the cost and performance of all available solutions while ensuring that the shared wireless broadband network has all the capabilities and attributes needed for a public safety broadband network.<sup>205</sup>

97. In the *Second Further Notice*, we sought comment on whether we should clarify or modify any aspect of the technical network requirements adopted in the *Second Report and Order* or otherwise establish with more detail the technical requirements of the network.<sup>206</sup> To guide the discussion and enable more focused comment, we attached as an appendix a possible technical framework (“Technical Appendix”) that identified in greater detail potential technical parameters for the shared wireless broadband network. We sought detailed comment on the Technical Appendix.

98. We also sought comment on whether any changes to requirements were needed to reflect the practical differences between the architecture of traditional local wireless public safety systems and the architecture of nationwide commercial broadband network systems.<sup>207</sup> Conversely, we sought

<sup>202</sup> *Second Report and Order*, 22 FCC Rcd at 15433 ¶ 405.

<sup>203</sup> *Id.*

<sup>204</sup> *Id.* at 15434 ¶ 406.

<sup>205</sup> *Id.* at 15426 ¶ 383.

<sup>206</sup> *Second Further Notice*, 23 FCC Rcd at 8071 ¶ 61.

<sup>207</sup> *Second Further Notice*, 23 FCC Rcd at 8072 ¶ 64.

comment on whether to require national standardization in the implementation of the network requirements, and the extent to which national standardization would help the network to achieve efficiency and economies of scale and scope.<sup>208</sup>

99. Further, we sought comments on other specifications we required of the network, including:

- A mechanism to automatically prioritize public safety communications over commercial uses on a real-time basis and to assign the highest priority to communications involving safety of life and property and homeland security consistent with the requirements adopted in the *Second Report and Order*;
- Operational capabilities consistent with features and requirements specified by the Public Safety Broadband Licensee that are typical of current and evolving state-of-the-art public safety systems (such as connection to the PSTN, push-to-talk, one-to-one and one-to-many communications, etc.);
- Operational control of the network by the Public Safety Broadband Licensee to the extent necessary to ensure public safety requirements are met; and
- A requirement to make available at least one handset that would be suitable for public safety use and include an integrated satellite solution, rendering the handset capable of operating both on the 700 MHz public safety spectrum and on satellite frequencies.<sup>209</sup>

100. We sought comment on whether the Commission should itself establish, in a detailed and comprehensive fashion, the technical obligations of the D Block licensee with regard to the network, and if so, what specifications it should adopt. We sought comment on whether the technical framework set forth in the Technical Appendix could, following comment on its specific components, help establish an appropriate set of requirements for the shared wireless broadband network.<sup>210</sup> We also sought comment on a number of particular technical issues.<sup>211</sup>

101. The majority of commenters argue that the Commission should provide more specificity regarding technical network requirements. APCO, for example, recommends that "all steps be taken to either pre-define or eliminate as many negotiating points of the NSA as possible."<sup>212</sup> AT&T states that the Commission must "clarify the key requirements for the public safety network and the rights and responsibilities for all parties to the Public/Private Partnership ..." and that making such clarifications will "inform commercial entities about potential risks, benefits, and required amounts of financial investment, which will enable commercial entities to evaluate the commercial viability of the Public/Private Partnership."<sup>213</sup> The PSST agrees that "a substantially more detailed list of technical specifications should be developed in advance of the D Block re-auction."<sup>214</sup> It states that, on balance, "the benefit of greater certainty for prospective bidders outweighs the natural inclination of parties to maintain maximum flexibility during a negotiation process, particularly one of such complexity and economic

<sup>208</sup> *Second Further Notice*, 23 FCC Rcd at 8072 ¶ 64.

<sup>209</sup> *Second Report and Order*, 22 FCC Rcd. at 15433-34 ¶ 405.

<sup>210</sup> *Second Further Notice*, 23 FCC Rcd at 8074 ¶ 70.

<sup>211</sup> *Second Further Notice*, 23 FCC Rcd at 8074-79 ¶¶ 71-83.

<sup>212</sup> APCO Comments at 26.

<sup>213</sup> AT&T Comments at 9.

<sup>214</sup> PSST Comments at 29.

significance.<sup>215</sup> The PSST provides proposed rules that include detailed technical requirements for the shared wireless broadband network.<sup>216</sup>

102. Discussion. We note that several technical issues, such as network coverage, prioritization of services, and operational control of the network are addressed elsewhere in this notice. In this section, we specifically address requirements pertaining to: the broadband technology platform; interoperability; availability, robustness and hardening of the network; capacity, throughput and quality of service; security and encryption; power limits/power flux density limits/related notification and coordination requirements; and the satellite-capable handset requirement.

103. Based on the record developed in this proceeding, we tentatively conclude that we should establish more detailed technical requirements for the shared wireless broadband network. We tentatively conclude that this approach will provide additional certainty regarding the obligations of the D Block licensee(s) and the costs of the shared wireless broadband network. We anticipate that specifying the technical requirements as completely as possible at this time, and reducing the issues that will be left to post auction negotiation, will provide greater assurance to potential bidders regarding the commercial viability of the shared wireless broadband network while ensuring that the network meets public safety's needs.<sup>217</sup> Thus, we tentatively conclude that the detailed technical requirements we propose to adopt as described herein would best serve the Commission's goal of making a broadband, interoperable network available on a nationwide basis to public safety entities. We seek comment on these tentative conclusions.

104. As noted earlier, a number of commercial interests assert that the costs associated with deploying a shared network designed to public safety specifications would exceed those of typical commercial networks and would directly impact the commercial viability of the network.<sup>218</sup> They maintain that simply building another commercial grade network will be inadequate to meet public safety needs, and that it is imperative that the wireless broadband network be designed to meet the performance requirements of public safety and to provide the necessary features and applications so that public safety can effectively discharge their duties. Many of the commenters from the public safety community argue that public safety's requirements must not be diminished in order to make the shared wireless broadband network commercially viable. Motorola suggests that it is not possible to balance the interests of public safety and commercial service providers and that additional funding from the Federal government is required to make the combined network successful.<sup>219</sup> APCO supports the development of a national, interoperable, broadband network that is designed, maintained, and operated to meet the requirements of public safety, but recognizes that some compromises regarding public safety requirements may be necessary to attract a private sector partner through the D Block auction.<sup>220</sup> In developing our proposed technical rules, we have attempted to balance public safety's requirements with the capabilities that may be commercially viable based on the record in this proceeding. The proposed technical requirements take into account the detailed technical requirements proposed by the PSST and comments filed in response to the *Second Further Notice* and Technical Appendix.

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<sup>215</sup> PSST Comments at 29.

<sup>216</sup> Addendum to PSST Comments.

<sup>217</sup> We have appended an NSA term sheet, which provides a summary of major terms that the parties must include in their agreement(s). See Appendix E.

<sup>218</sup> AT&T Comments at 2; MetroPCS Comments at 5; Motorola Comments at 7-9; Sprint Nextel Comments at 13; Verizon Wireless Comments at 3.

<sup>219</sup> Motorola Comments at 7.

<sup>220</sup> APCO Comments at 6.

105. *Broadband Technology Platform.* Many commenters argue that the Commission should adopt guidelines specifying that the joint network must be built with state-of-the-art, commercially available, standards-based technology.<sup>221</sup> For example, AT&T argues that the baseline guidelines should be sufficiently flexible to permit the use of existing commercial technology, where such components meet public safety's capability requirements.<sup>222</sup> We agree with commenters that maximizing the use of commercially available technology can substantially increase the speed and decrease the cost of deployment of the network.<sup>223</sup> In addition, it is also likely to significantly reduce the costs of end user devices for first responders. Moreover, by permitting the leveraging of existing commercial network infrastructure, the shared wireless broadband network will be able to be built out more efficiently, thus making participation in the Partnership more attractive to commercial entities.<sup>224</sup> Thus, based on these considerations, we tentatively conclude that the network should utilize standardized commercial technologies. We further propose that the broadband platform must be IP-based and should also include current and evolving state-of-the-art technologies reasonably made available in the commercial marketplace with features beneficial to the public safety community.

106. We tentatively conclude that the shared wireless broadband network must provide for fixed and mobile voice, video, and data capability. Some parties indicate that certain applications, such as fixed video surveillance and fixed point-to-point and point-to-multipoint services, could use substantial capacity in the network and should use other spectrum. Alcatel-Lucent notes, for example, that "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 provide public safety with mission-critical operational capabilities without compromising the economic viability of the public/private partnership."<sup>225</sup> Stagg Newman argues that applications such as streaming video could consume much of the capacity of a network and would have a dramatic effect on the cost of the network.<sup>226</sup> Other commenters, such as Tyco Electronics, argue that the Commission should "afford public safety agencies maximum flexibility in the use of D Block Spectrum."<sup>227</sup> We appreciate the concern that certain applications could have a significant impact on network design and costs. However, we find that any effort to prohibit certain types of applications would be counterproductive to encouraging development and use of the shared wireless broadband network. We note that emerging networks and technologies are capable of accommodating a wide variety of services. We expect that the operators and users of the shared wireless broadband network will make reasonable judgments as to the applications that will run on the network and will adapt the network to meet evolving requirements. We invite comment on this tentative conclusion.

<sup>221</sup> See PSST Comments, Attachment C at 2; AT&T Reply Comments at 18 (citing Ericsson Comments at 9-15; Interisle Comments at 11; Motorola Comments at 7; NATOA Comments at 9 and Technical Report Attachment; Northrop Grumman Comments at 6-7; Qualcomm Comments at 8-10; Verizon Wireless Comments at 16-18; Wireless RERC Comments at 7-8).

<sup>222</sup> AT&T Reply Comments at 18.

<sup>223</sup> AT&T Comments at 10; Ericsson Comments at 14-15; Verizon Wireless Comments at 16-18; AT&T Reply Comments at 18.

<sup>224</sup> AT&T Reply Comments at 18-19.

<sup>225</sup> ALU Comments at 6.

<sup>226</sup> See, e.g., Testimony of Stagg Newman, Public Hearing on Public Safety Interoperable Communications - The 700 MHz Band Proceeding, Federal Communications Commission, July 30, 2008, at 2, <http://www.fcc.gov/realaudio/presentations/2008/073008/newman.pdf>. (estimating that increase in cell edge speed from 300 kbps/75 kbps downlink/uplink to 1.2 Mbps/512 kbps downlink/uplink, combined with a requirement of inbuilding coverage, would require 2 to 4 times the number of cellsites, at a construction cost of \$200,000 to \$500,000 and annual operating cost of \$50,000 to \$100,000 for each cellsite).

<sup>227</sup> Tyco Comments at 7.

107. We note that a variety of commenters – including public safety and commercial entities – assert that the D Block licensee should take the lead role in choosing the underlying technology of the network, in cooperation with the Public Safety Broadband Licensee and according to minimum specifications set by the Commission.<sup>228</sup> We disagree with commenters who argue that the Commission should make a specific choice of technology. In view of these commenters' differing opinions regarding the most appropriate technology,<sup>229</sup> there does not appear to be a basis for a determination regarding the viability of any particular technology for shared network at this time. Thus, we tentatively conclude that the public interest would be better served by allowing certain flexibility to parties interested in the D Block to make a determination regarding the technology for the network.

108. We tentatively conclude, however, that the shared wireless broadband network must use a common air interface to ensure nationwide interoperability as discussed elsewhere in this notice. We propose that the air interface be selected in a manner that provides interested parties as much flexibility and control as possible in the choice, and with the ability to bid on a license with the confidence regarding what technology will be applicable. We note that the record supports a conclusion that two next generation technologies in particular, WiMAX and LTE, provide the most likely options to provide the necessary broadband level of wireless service to public safety entities.<sup>230</sup> In light of these goals and observations, we propose to adopt two approaches with regard to determining the common broadband technology, tailored to whether the Commission assigns a nationwide licensee or regional licensees. In the event of a nationwide licensee, because there is no concern that different entities will seek to adopt different broadband radio access network technologies, we propose to allow the D Block license winner complete authority and discretion to choose its broadband technology after winning the license. In the event of regional licensees, however, we find that permitting them to choose their own technology would run an unacceptable risk of the licensees choosing different technologies, or being otherwise unable to agree on a technology. Further, we recognize that it would be problematic for the Commission itself to establish a common technology post-auction, as parties will likely consider the broadband technology a critical element of their business plans and an important factor in determining whether to bid for a license. Accordingly, to enable the selection of a single broadband technology standard that will apply to all regional licensees, we propose to use the auctions process itself. More specifically, we tentatively conclude that we will offer three alternative sets of licenses: regional licenses conditioned on the use of WiMAX technology and regional licenses conditioned on the use of LTE technology, as well as the third set of a single nationwide license. The bidder(s) for the set covering the greatest aggregate population at the close of bidding (with ties between sets broken by which of the tied sets received the highest gross bids in the aggregate) will become the provisionally winning bidder(s) and determine whether the Commission will grant the nationwide license, the WiMAX PSR licenses, or the LTE PSR licenses, subject to post-bidding application of a minimum sale requirement and all other conditions of the licensing process established by Commission rules, including those specific to the D Block. We discuss this process in greater detail elsewhere in this Third Further Notice. We seek comment on our proposed determinations regarding the radio access technology platform for the shared network.

109. We are cognizant that wireless broadband networks have already been deployed in the 700 MHz public safety spectrum in certain areas. We do not wish to disrupt existing operations that represent substantial investments and are working well to serve local public needs. We invite comment as to what steps, if any, should be taken with regard to such systems that may ultimately not be compatible

<sup>228</sup> AT&T Reply Comments at 18 (citing Leap Wireless Comments at 12-13; NPSTC Comments at 39; NTCH Comments at 7; RPC 33 Comments at 13-14; Comments of Wirefree Partners III, LLC at 14-15).

<sup>229</sup> See Comcentric Comments at 5; Qualcomm Comments at 8; MSV Comments at 21; MSUA Comments at 22; Space Data Corp. Comments at 8-9; SDR Comments at 23-24; Ericsson Comments at 10, 13-14.

<sup>230</sup> See, e.g., InterIsle Comments at 2 (“there is much to be gained by leveraging CMRS technology on behalf of Public Safety users. Technologies such as WiMAX and especially LTE are very promising . . .”).

with the nationwide shared wireless broadband network technology. For example, should we require use or availability of multi-band radios that could be available to public safety first responders that may need to come into these areas in times of emergency? If so, how could this be implemented and in what timeframe?

110. *Interoperability.* We tentatively conclude that the network must provide voice, video, and data capabilities that are interoperable across agencies, jurisdictions, and geographic areas. By interoperable, we mean that the technology, equipment, applications, and frequencies employed will allow all participating public safety entities, whether on the same network or on different regional 700 MHz public safety broadband networks, to communicate with one another regardless of whether they are communicating from their home networks or have roamed on to another regional network. To achieve this level of interoperability, we tentatively conclude that, as discussed in detail above, the shared wireless broadband network must use a common air interface.<sup>231</sup> We take note that certain parties assert that a nationwide common air interface is not necessary because most interoperability is conducted locally. However, in times of a crisis public safety agencies often provide assistance far beyond their typical areas of operation. We recognize that one solution is for the local public safety agencies to supply compatible equipment to public safety agencies that are coming from another area to provide assistance. Such an approach has significant drawbacks because it requires a significant supply of extra equipment at additional expense. We also note arguments that multiple air interfaces could be accommodated through the use of handsets that can operate over multiple broadband air-interfaces or through use of software defined radios, particularly at base stations. We are concerned, however, that such equipment comes at additional expense that would be borne by all public safety users. It is also not clear from the record when handsets able to work over all the broadband platforms chosen by the various licensees would be available. Further, if these multi-mode handsets were produced solely to serve the public safety broadband networks, the Public Safety Broadband Licensee would have less opportunity to equip first responders with off-the-shelf handsets that could be obtained at significantly less cost than customized public safety user devices. We solicit comment on our tentative conclusion that selection of a single air interface is necessary to ensure nationwide interoperability.

111. As discussed elsewhere, to achieve interoperability with respect to the geographic area option of PSRs, we tentatively conclude that we will offer at auction alternative sets of PSRs, each conditioned on the licensees' use of a particular technology platform. We further tentatively conclude that, in the event that there are multiple D Block licensees, each regional D Block license winner should be required to enter into arrangements both with the other D Block license winners and with the Public Safety Broadband Licensee as necessary to ensure interoperability between networks. We propose that such arrangements provide, at a minimum, that each D Block licensee will provide the ability to roam on its network to public safety users of all other 700 MHz public safety broadband networks.<sup>232</sup> We further propose that the NSA of each regional D Block licensee must specify that the licensee will provide public safety users of all other 700 MHz public safety regional networks with the ability to roam on its network, and should specify the relevant terms and conditions under which roaming is provided. However, to ensure that the broadband network supports public safety interoperability, we propose that D Block licensees should not be permitted to assess special roaming charges (over and above service fees charged for in-region use) in cases where public safety users require roaming for mutual aid or emergencies.

112. A number of commenters suggest that further clarity is needed with regard to the role of the shared wireless broadband network relative to interoperability with existing public safety networks. For example, some parties question whether the shared network was to be used for ensuring

<sup>231</sup> See, e.g., NYPD Comments at 10 ("Regional interoperability can be achieved by adapting a common air interface and operating on a common frequency band.").

<sup>232</sup> We do not, however, propose to require that such roaming arrangements extend to commercial services.

interoperability with existing legacy public safety voice systems or just for users of this spectrum. APCO notes that, while the shared network will have capabilities for voice, data and video systems, existing public safety systems will be used well into the future.<sup>233</sup> We observe that considerable work has been done and is under way to ensure interoperability among existing public safety communications systems.

113. We expect that the shared wireless broadband network will ensure interoperability in a variety of ways. All public safety users that opt to use the shared wireless broadband network will have the capability to be interoperable because they will be using a common air interface. As a result, radios could be taken from one jurisdiction to another, such as occurs for disaster relief, and will have the ability to communicate with other public safety users in that area. Moreover, multi-band radios could be developed, although at some cost premium, that are capable of operating on both the shared wireless broadband network and other public safety frequency bands.

114. The shared wireless broadband network could also be integrated with other public safety communications systems via gateways and bridges, as already occurs for existing public safety systems operating across multiple frequency bands. In this regard, we believe it is important that we ensure that the shared wireless broadband network have the technical capability to support interconnection with public safety operations in public safety frequency bands other than the 700 MHz public safety spectrum broadband allocation.<sup>234</sup> Specifically, we mean to provide public safety with the opportunity to interconnect existing voice-based public safety communications systems operating in VHF, UHF, and narrowband 700 MHz and 800 MHz bands with the shared network(s). We therefore propose to require the D Block licensee(s) to publish IP-based specifications enabling public safety operations in other frequency bands to access the shared broadband network(s) via bridges and/or gateways. We further tentatively conclude to require the Upper 700 MHz D Block licensee to offer gateway-based access to the shared network(s) for a standard charge per user (meaning per public safety officer/individual), and propose that a fee of \$7.50 per month may serve as an appropriate amount.<sup>235</sup> As seen in Table 1, we base this proposed fee on our survey of monthly rates for services approximating land mobile radio – including “walkie-talkie” and push-to-talk service – that are add-ons to basic monthly service plans and offered under standard government contracts to public safety users. We also propose that public safety users themselves bear the costs of the bridges and gateways, including installation and maintenance costs, because such equipment would essentially serve as an extension of existing public safety systems. Parties who suggest that the costs of gateways or bridges should be shared between the D Block licensee and the Public Safety Broadband Licensee should provide specific information as to the costs involved, rationale for sharing these costs, and formula for sharing the costs. We invite comment on these proposals.

Table 1. Survey: Service Rates for Walkie Talkie/Push-To-Talk Service

Contracting Entity/Authority	Wireless Operator	Service Plan	Monthly Service Rate
State of Florida	Verizon Wireless	Basic Push to Talk (Florida Plan)	\$10.00 <sup>236</sup>

<sup>233</sup> APCO Comments at 10.

<sup>234</sup> We intend to include voice service presently conducted on VHF, UHF.

<sup>235</sup> Any gateway-based access service necessarily assumes a public safety network in place providing radio coverage on the desired frequencies in the area of operation.

<sup>236</sup> State of Florida, Department of Management Services, Wireless Voice Services, State Term Contract #725-330-05-1, Amendment 4, available at [http://dms.myflorida.com/business\\_operations/state\\_purchasing/vendor\\_information/state\\_contracts\\_agreements\\_and\\_price\\_lists/state\\_term\\_contracts/wireless\\_voice\\_services/contractors\\_verizon\\_wireless](http://dms.myflorida.com/business_operations/state_purchasing/vendor_information/state_contracts_agreements_and_price_lists/state_term_contracts/wireless_voice_services/contractors_verizon_wireless) (last viewed on Sept. 11, 2008). The plan includes unlimited one to one and group Push to Talk calling.

Contracting Entity/Authority	Wireless Operator	Service Plan	Monthly Service Rate
State of New York	Verizon Wireless	America's Choice for Business Plan – Push to Talk Option	\$8.10 <sup>237</sup>
	Sprint Nextel	Unlimited Nextel Group Walkie-Talkie	\$7.50 <sup>238</sup>

115. We recognize that interoperability may not be fully achievable without attention to the use of compatible applications. As discussed elsewhere, the Public Safety Broadband Licensee is responsible for approving public safety applications and end user devices. Accordingly, we propose to clarify that in exercising this responsibility, the Public Safety Broadband Licensee must ensure that any applications and end users devices it approves must be consistent with the interoperability requirements contained in the Commission's rules and in accordance with the NSA. We invite comment as to the merits of this approach and any other methods to achieve interoperability among user applications. In particular, to promote interoperability, including interoperability with legacy voice systems, we propose to require the Shared Wireless Broadband Network to support a Voice over Internet Protocol (VoIP) capability to complement existing public safety mission critical voice communication systems.

116. If there are multiple regional D Block licensees, it may be necessary to establish a mechanism to enable public safety to coordinate with and establish common approaches among these licensees with regard to interconnection standards, compatibility with common applications, authentication, etc. We invite comment on whether the Commission needs to take any specific actions in this regard or it can be left to the various licensees.

117. *Availability, Robustness and Hardening.* Several commenters offer specific proposals regarding the robustness and hardening requirements for the network.<sup>239</sup> After reviewing the record, we have made a number of changes to the proposals in the Technical Appendix that are reflected in the proposed rules. We propose to require 99.6 percent network availability for all terrestrial elements of operation, as suggested by US Cellular. The D Block licensee(s) shall use commercially reasonable efforts to provide network availability above this requirement, with the target of 99.9 percent network availability. The methods of measurement are to be defined in the Network Sharing Agreement. Sites designated as “critical” will be required to have battery backup power of 8 hours, and shall have generators with a fuel supply sufficient to operate the generators for at least 48 hours. The D Block licensee(s) will make reasonable efforts to provide a fuel supply at “critical” sites above this requirement sufficient for a minimum of 5 days. The designation of a site as “critical” shall be a joint decision by the D Block licensee(s) and the Public Safety Broadband Licensee, in consultation with the relevant community. The designation of sites as “critical” shall not be required to cover more than 35 percent of the shared wireless broadband network sites for the D Block license(s); however, the D Block licensee(s) shall use commercially reasonable efforts to designate as “critical” additional sites requested by the Public Safety Broadband Licensee, up to 50 percent of all the licensee’s sites. We request comments on these proposals.

<sup>237</sup> State of New York, Office of General Services, Verizon Wireless Contract Number PS61217 (effective August 15, 2007), available at <http://www.ogs.state.ny.us/purchase/prices/7700802459prices1207.pdf> (last viewed on Sept 11, 2008). This rate is available as an add on option for subscribers of the basic voice plan offered by Verizon for \$32.99 per month.

<sup>238</sup> *Id.* This price reflects a 25 percent discount off the standard retail rate of \$10.00 per month. We note that Sprint Nextel also offers a “Basic 200 Plan” for \$5 per month.

<sup>239</sup> *See, e.g.*, Telecate Comments at 10, PSST Comments Appendix C at 3, Peha Comments at 13.

118. We also find considerable support in the record for permitting reliance on non-terrestrial options to ensure reliability. The PSST, for example, suggests that reliability, availability, and hardening expectations could be “achieved through a variety of means [including] backup reliance on satellite coverage.”<sup>240</sup> SIA, MSV, Inmarsat, and MSUA all encourage the use of satellite services as part of the nationwide network. Several other commenters also support the use of satellite or similar services to complement the overall network.<sup>241</sup> MSV in particular proposes that the Commission “offer the D Block licensee the option of providing satellite service in return for greater flexibility in meeting certain license requirements.”<sup>242</sup> These commenters argue that non-terrestrial services can provide critical redundancy to a terrestrial system, increasing the reliability and robustness of the network.<sup>243</sup> MSV states, for example, that “disasters that impair or destroy terrestrial wireless networks either directly or by disabling the power grid are extremely unlikely to have any adverse impact on satellite networks.”<sup>244</sup>

119. We agree with commenters that non-terrestrial capabilities can serve the interests of public safety by increasing the survivability of the system. Although we do not expect that non-terrestrial service can fully substitute for terrestrial network services, we find that imposing hardening, and robustness requirements on all sites of the network would jeopardize the economic viability of the network. Accordingly, we propose to permit the D Block licensee(s) and the Public Safety Licensee to agree on other methods to improve network resiliency in lieu of designating critical cell sites. These might include deployment of mobile assets or the use of satellite facilities. Parties are invited to comment on this proposal. We also seek comment on whether additional satellite capability would further enhance the nationwide shared wireless broadband network and whether it would serve the public interest to provide additional flexibility to a D Block licensee in meeting its licensing obligations if it integrates a satellite component or other non-terrestrial technology with the shared wireless broadband network.

120. *Capacity, Throughput, and Quality of Service.* A number of parties note that an analysis of the economic viability of the shared wireless broadband network cannot be made without addressing certain key technical parameters such as edge of cell data rates and data rates for indoor coverage.<sup>245</sup>

<sup>240</sup> PSST Comments, Attach. C at 3. See also PSST Comments at 34 n.72.

<sup>241</sup> See Washington Comments at 1; Mississippi Comments at 1; Comcentric Comments at 4; Wirefree Comments at 15. Space Data advocated using their “near space,” “balloon-borne” network of transceivers that can reach 99.3% of the population less expensively than construction a terrestrial network with similar reach. Space Data Comments at 1-3, 7. The SDR Forum notes that cognitive radios could be used as “an enabling technology” to help integrate satellite and terrestrial services. SDR Forum at 20-21, 23.

<sup>242</sup> MSV Comments at i-ii.

<sup>243</sup> See e.g. MSV Comments at 21.

<sup>244</sup> MSV Comments at 9-10.

<sup>245</sup> See ALU Comments at 5 (recommending: (1) a minimum cell edge data rate of 256 Kbps on the forward link (base to mobile), and 128 Kbps on the reverse link (mobile to base); (2) a link budget supporting 95% (area) coverage reliability corresponding to 90% (edge) contour reliability; and (3) a median throughput per transceiver of 1 Mbps downstream and 600 Kbps upstream over 50% of the service area). See also, Stagg Newman Comments, attached White Paper “750 MHz RF Coverage Design for the State of North Carolina”, pp 19 – 20, proposing 1.0 – 2.0 Mbps forward link and 450 – 750 kbps return link (avg.) over 90% of the coverage area and 300 kbps forward link and 50 kbps reverse link at the cell edge covering 85% of the population of North Carolina; See also Public Safety Spectrum Trust Comments, attachment C “Shared Wireless Broadband Network Technical Analysis” Table 1-A proposing 1000 kbps forward link and 256 kbps reverse link for dense urban and urban morphologies, 512 kbps forward link and 128 kbps reverse link for suburban and rural morphologies, and 128 kbps forward link and 64 kbps reverse link for highways; See also, US Cellular ex-parte of August 29, 2008 proposing to revise these values to 256 kbps in both directions in urban environments, 128 kbps in both directions for suburban and rural areas, and 64 kbps in both directions on highways, under conditions of 70% loading.

Our proposed rules address these and other points raised by commenters.

121. We propose that the shared wireless broadband network typically provide data speeds of at least 1 Mbps in the downlink direction and 600 Kbps in the uplink direction. Irrespective of this requirement, the D Block licensee(s) must provide public safety users with data speeds that are at least as fast as the best data speeds provided to commercial users of the shared wireless broadband network. We also propose that, at the edge of coverage, the shared wireless broadband network shall provide for data rates of a minimum of 256 kbps directions in urban environments, 128 kbps for suburban and rural areas, and 64 kbps on highways, all under 70 percent loading conditions, in both the downlink and uplink directions as recommended by US Cellular. We recognize that these data speeds may appear to be relatively slow, but note that they generally ensure that basic service is available even at the edge of coverage under relatively high traffic conditions. For purposes of this rule, we propose that dense urban will encompass areas where the population per square mile is 15,000 people or greater; urban 2,500 – 14,999, suburban 200-2499, and rural 0 – 199, as suggested by the PSST.<sup>246</sup> We also propose these data speeds serve only as design objectives. It would not be practical or appropriate to apply these data rates as the minimum for any given device at any particular time or location. We appreciate the need to address planning factors for indoor coverage. We are proposing propagation factors in the rules that are to be taken into account in designing the shared wireless broadband network relative to indoor coverage for VoIP service. We find that it is appropriate to focus only on VoIP because these types of communications occur in real time. Nonetheless, we find that designing the system for indoor VoIP coverage may well serve to ensure the availability of data service in buildings as well. We also propose to address service to vehicles moving at speeds of up to 100 mph by planning for coverage based on a 1.5 Watt EIRP mobile vehicle mounted radios.<sup>247</sup> We invite comment on these specific proposals

122. We are not proposing any specific requirements relative to overall capacity of the shared wireless broadband network.<sup>248</sup> The overall capacity of a network is very difficult to define because it can depend on many variables such as the level of use at particular locations, how use varies over time, the types of applications that are used, etc. Moreover, it is not feasible to establish rules that would address the various capacity requirements throughout the nation. For example, the capacity required in a dense urban area where public safety has implemented a wide variety of broadband applications would be much greater than in a rural area where only minimal broadband applications might be used. We also note that none of the commenters specifically addressed overall capacity of the wireless broadband network other than in the context of specifications for data speeds or to suggest that capacity should be negotiated under the Network Sharing Agreement. We agree that the capacity of the shared wireless broadband network would be best addressed through negotiation under the Network Sharing Agreement. We do not anticipate that this will create any significant uncertainty for prospective D Block licensee(s) because we expect the capacity requirements will generally follow the patterns of commercial networks. We solicit comment on this analysis. We are also proposing to require that the Network Sharing Agreement include a process for demand forecasting and that the D Block licensee(s) deliver to the Public Safety Broadband Licensee monthly capacity utilization reports as discussed below.

123. We also propose a number of requirements to ensure quality of service for public safety. We note that the Department of Homeland Security is working on developing wireless priority service for

<sup>246</sup> Public Safety Spectrum Trust Comments, Attachment C “Shared Wireless Broadband Network Technical Analysis” Table 1-B.

<sup>247</sup> See Stagg Newman Comments, attached White Paper “750 MHz RF Coverage Design for the State of North Carolina”, pp 19 – 20, proposing an assumed 1.5 Watt EIRP vehicle mounted radio for public safety vehicles.

<sup>248</sup> Elsewhere in this Third Further Notice, however, we require the D Block licensee(s) to ensure public safety users’ access to 10 megahertz of spectrum at all times and 12 to 14 megahertz of spectrum in the case of emergencies. See *supra* discussion of Spectrum Use Issues.