

injuries directly to a trauma specialist.<sup>96</sup> In a possible scenario that would combine the use of video and data interoperability communications, video taken by police, fire, or EMS personnel at the scene of an emergency could be transmitted on a "slow motion video interoperability channel" to a nearby hospital; and then instructions regarding how to treat victims could be transmitted to personnel at the scene using a "data interoperability channel." In addition, video communications may also be required by highway departments for mutual aid purposes — *e.g.*, to share unit location and weather conditions among transportation agencies of different jurisdictions, and to connect with the Emergency Management Command Centers during major incidents (*e.g.*, hurricanes, tornadoes, blizzards, and earthquakes).<sup>97</sup>

51. An important concern in this proceeding is whether and how each of these types of potential interoperability communications could or should be accommodated in our designation of interoperability spectrum. We propose to make spectrum available for the four general types of communication. We seek comment on this proposal and inquire whether we should designate interoperability spectrum for:

- Voice channels only (with data capability on such channels).
- Voice and data channels only.
- Voice, data, image/HSD, slow motion video, and full motion video channels.
- Channels that would accommodate some other combination of uses.

52. Commenters should indicate how each type of interoperability would actually be used. In particular, commenters advocating a channel allocation for full motion video should indicate their reasoning for reserving a relatively large amount of spectrum for such use, as opposed to providing for full motion video through alternative means.<sup>98</sup> We seek comment

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criminal trials, as appropriate; and ability to transmit real time video of accident scenes for use in safety investigations, litigation, and road design. NASTD Comments at 8-10.

<sup>96</sup> *PSWAC Final Report* at 31.

<sup>97</sup> *Id.* at 394.

<sup>98</sup> For example, the New York City Transit Authority states that commercial service might provide innovative services such as full motion video, which would be too expensive for a single agency, but which commercial entities might provide to a wider market. NYCT Comments at 12-13. Also, PG County states that a commercial entity or a consortium of local governments may be desirable for providing full motion video. PG County Comments at 6.

below on the specific channel spacings and number of channels that should be designated for each type of communication.<sup>99</sup>

### c. Transmission Technology

53. In order to ensure interoperability among all public safety agencies, an important factor to consider is whether to specify the modulation technology for interoperability channels. Because our goal is to provide for nationwide interoperability, we tentatively conclude that at a minimum we must specify whether analog FM or digital modulation technologies should be used. We consider these issues in the context of the various types of interoperability communications we are considering. Issues relating to the development of standards are more fully discussed in Section II.B.4., *infra*.<sup>100</sup>

#### (1) Voice

54. By way of background, most public safety equipment in use today for voice transmission employs analog FM technology.<sup>101</sup> In the future, however, digital systems will be implemented in the public safety services.<sup>102</sup> Digital technology offers certain advantages over analog for voice communications. For example, voice encryption, an important requirement for public safety communications, is more easily accomplished using digital technology,<sup>103</sup> and systems employing digital technology can be designed to operate effectively in the mobile environment.<sup>104</sup> On the other hand, the quality and clarity of digital voice systems for public safety communications, especially on 12.5 kHz channels, has not

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<sup>99</sup> See paras. 61-70, *infra*.

<sup>100</sup> See paras. 104-107, *infra*.

<sup>101</sup> PSWAC Final Report at 208. The Interoperability Subcommittee notes that analog FM technology is “well understood, and a common set of non-proprietary operating parameters has allowed users to communicate directly over the air using radios produced by different manufacturers.” *Id.* at 335. See also *id.* at 297.

<sup>102</sup> We use the term “digital technology” to refer to voice and data systems that employ direct digital modulation of a carrier. “Analog technology,” which is used for the transmission of voice, is also used for the transmission of data through digital modulation of a sub-carrier tone (in the same way computer modems transmit data on telephone lines). See *id.* at 219.

<sup>103</sup> Some commenters, including the PSWAC TESC, indicate, however, that analog scrambling techniques have advanced in recent years. Encryption, therefore, may not be a significant factor in deciding whether to employ digital or analog technology for voice interoperability channels. *Id.* at 208.

<sup>104</sup> See *id.* at 209.

been subjected to the variety of real world applications faced by the public safety community.<sup>105</sup>

55. Perhaps the most significant drawback of digital technology in the context of interoperable voice communications is that, while public safety equipment in use today employs the existing analog FM standard, in order for public safety users operating in the 746-806 MHz band to communicate on digital equipment, that equipment would have to be built to a not-yet-developed digital standard (*i.e.*, a standard that would require the use of a common voice coder, digital modulation scheme, *etc.*). Developing and implementing digital standards may be a difficult task, and an important consideration in allocating spectrum for voice interoperability is whether the advantages of digital technology warrant our mandating digital standards. The PSWAC ISC recommends that the minimum baseline technology for voice interoperability should be analog FM,<sup>106</sup> but that digital standards for interoperability should be developed within two years through “open standards developed/adopted in an open and fair process”<sup>107</sup> to allow for the eventual migration to digital technology. The PSWAC ISC believes that use of analog FM for voice interoperability will “suffice” perhaps until 2010, but that most users by then will be employing digital technology on their authorized channels and will want to operate in the digital mode on interoperability channels.<sup>108</sup>

56. We seek comment regarding whether the achievement of interoperability on analog or digital modulation for voice interoperability channels should be specified. In addition, we seek comment regarding whether standards on these channels, whether analog or digital, should be adopted. We ask commenters how long it would take to develop digital standards and whether the time associated with the development process offsets the advantages

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<sup>105</sup> APCO Project 25 has developed voluntary digital standards that provide for digital voice transmissions on a 12.5 kHz channel. Little or no equipment, however, using these standards is currently being employed in the field by public safety licensees. Similarly, the TETRA standard has been adopted for public safety communications in Europe, but no system has been fully implemented. *See* Cellular and Mobile International, D. Preiser, “Open Standards for Digital Trunked Mobile Radio,” May 1, 1997.

<sup>106</sup> In particular, the PSWAC ISC recommends an emission of 16K0F3E for voice interoperability channels. *PSWAC Final Report* at 52. The PSWAC ISC also states that “[w]e must make sure that any radios arriving on an incident have at least a baseline technology capability to talk directly to any other unit on the same frequency band on the scene.” *Id.* at 328.

<sup>107</sup> *Id.* at 424. The PSWAC ISC evaluated the option that an accredited standards setting organization be involved in the development of digital baseline standards and concludes that this requirement would be overly restrictive. In comparing the development of communications technology to that of the computer industry, they note that the “standard” platforms are proprietary. The premise is that a competitive environment will spur the development of the most technologically superior products for which the developer is entitled to recover the research and development costs by means of licensing “at fair and reasonable terms.” *Id.*

<sup>108</sup> *Id.* at 318.

of digital technology. We also seek comment regarding whether adopting a digital standard would result in all interoperability equipment being tied to *today's* digital technology for many years, even if that technology experiences great advances in the next century.<sup>109</sup>

## (2) Data, Image/HSD, and Video

57. As with voice, the transmission of data using digital technology has certain advantages over the transmission of data using analog FM technology. In particular, a greater data throughput can be achieved using digital technology.<sup>110</sup> For example, data speeds for current mobile data equipment using analog FM channels are on the order of 2400 to 4800 bits/sec on a 25 kilohertz channel, while the data rate for equipment using digital technology is as high as 19.2 kb/sec. Also, unlike voice communications, where the use of standard analog FM technology would not require the adoption of additional technical standards (only the adoption of a standard channel spacing), achievement of interoperability on analog data channels *would* require the establishment of a set of standards similar to those necessary for digital data channels.<sup>111</sup> Thus, given that technical standards will have to be developed regardless of whether analog or digital technology is used for data channels, we propose to adopt the use of digital modulation on such channels, in order to benefit from the throughput advantages of digital technology.

58. Image/HSD and video communications<sup>112</sup> also involve the transmission of digital information. Both of these types of communications differ from data communications only in the sense that image/HSD and video transmissions would occur at much higher bit rates. For example, in its Report, the PSWAC TESC discusses various types of image/HSD communications (*e.g.*, facsimiles, snapshots, and NCIC 2000) that would require the transmission of large numbers of data bits.<sup>113</sup> The TESC Report also indicates that slow

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<sup>109</sup> For example, through the years there have been many advancements in voice coder design and we can only assume that such advancements will continue in the future. *See id.* at 228-29.

<sup>110</sup> Greater throughput in data communications enables information to be transferred faster.

<sup>111</sup> *See PSWAC Final Report* at 44.

<sup>112</sup> As discussed above, video communications, in the context of this proceeding, include slow motion and full motion video communications. *See* para. 50, *supra*. The full motion video systems referred to by commenters are digital systems, which occupy less spectrum than existing analog television systems. Slow motion digital systems occupy still less spectrum.

<sup>113</sup> *PSWAC Final Report* at 230-31.

motion video systems could operate at 384 kb/sec, while full motion video systems would require a data rate of approximately 1.5 Mb/sec.<sup>114</sup>

59. Thus, the same considerations discussed above with regard to data communications would apply to image/HSD and video communications. Image/HSD or video systems based on the transmission of data using digital technology would be more spectrally efficient than systems using analog technology. Digital systems would enable faster transmission of information on a given amount of spectrum for image/HSD communications, and would enable the transmission of video communications on less spectrum. Additionally, both analog-based and digital-based image/HSD and video systems would require a certain degree of standardization.<sup>115</sup> To take advantage of the benefits of digital technology, we propose to mandate digital modulation for image/HSD and video interoperability channels.

60. We seek comment regarding our proposal to mandate the use of digital modulation for data, image/HSD, and video interoperability channels. As a related issue, we seek comment regarding whether technical standards should be mandated for data, image/HSD, or video equipment used for interoperability. If so, what technical standards would be necessary on data, image/HSD, and video channels to achieve interoperability if digital systems, or analog-based systems, are employed? In addition, commenters should indicate the data rates they believe are desirable or necessary for each type of digital communication (*i.e.*, data, image/HSD, and video).

#### **d. Channel Spacing**

61. An important consideration in deciding how spectrum should be designated for different types of interoperable communications is the spacing of the channels needed to support such communications. We therefore explore this issue with respect to each of the four categories of interoperable communications discussed above, and request comment on any other categories that may be appropriate.

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<sup>114</sup> *Id.* at 232.

<sup>115</sup> Analog video transmissions, like analog FM voice, employ commonly accepted technical parameters and would therefore not require the development of new standards. For digital video transmission, however, there are two standards under development. The International Standards Organization (ISO) supports the MPEG (Motion Picture Expert Group) standard designed as a single direction protocol at 1.5 Mb/sec. The International Telecommunications Union (ITU) has the H-Series designed for two-way video conferencing at 384 kb/sec for one frame per second and allowing for a variable frame rate. *PSWAC Final Report* at 231-32. Also, APCO Project 34 is currently involved in developing standards for the transmission of high speed data and images, such as mugshots, fingerprints, and NCIC 2000 information.

62. Prior to the adoption of the *Refarming Report and Order*, public safety spectrum in the 150 MHz, 450 MHz, and 800 MHz bands was channelized based on a maximum authorized bandwidth of 20 kilohertz. This bandwidth limitation applied to channels spaced 15 kilohertz apart in the 150 MHz band, 25 kilohertz apart in the 450 MHz band and 800 MHz band, and 12.5 kilohertz apart in the 821-824/866-869 MHz band. Thus, most public safety equipment in use today employs technology based on a bandwidth limitation of 20 kilohertz. The *Refarming Report and Order* required that land mobile equipment authorized for use in the future on land mobile frequencies below the 512 MHz band employ channels that are no more than 12.5 kilohertz apart with a maximum authorized bandwidth of 11.25 kilohertz.<sup>116</sup>

63. There are various factors that we may consider in attempting to determine the most appropriate spacings for voice interoperability channels. The PSWAC ORSC, in particular, discusses the need for public safety communications to achieve a minimum voice quality standard.<sup>117</sup> Although the PSWAC ORSC does not discuss this standard in the context of channel spacing, channel spacing may be a factor in attaining the level of voice quality described by the PSWAC ORSC. Another consideration is that the PSWAC ISC recommends an emission of 16K0F3E for voice interoperability channels.<sup>118</sup> The PSWAC ISC, however, does not propose a particular channel spacing to accommodate that emission. In addition, we may want to consider that the 746-806 MHz band is adjacent to the 806-821 MHz band, which has channels spaced 25 kilohertz apart. Providing voice interoperability channels in the 746-806 MHz band with this channel spacing may enable licensees operating in the 806-821 MHz band to more easily incorporate the 746-806 MHz interoperability channels into their equipment.<sup>119</sup>

64. In determining the most appropriate spacing for data interoperability channels, an important consideration is that wider channels generally enable greater amounts of information to be transmitted in a given amount of time. Thus, we seek comment regarding these related issues:

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<sup>116</sup> Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Radio Services, PR Docket No. 92-235, Report and Order and Further Notice of Proposed Rulemaking, 10 FCC Rcd 10076, 10080-82 (para. 7) (1996) (*Refarming Report and Order*).

<sup>117</sup> This is the DAQ - 3.4 voice quality standard, as developed by Telecommunications Industry Association (TIA) and the Institute of Electrical and Electronics Engineers (IEEE). *PSWAC Final Report* at 150-55.

<sup>118</sup> *PSWAC Final Report* at 52.

<sup>119</sup> See para. 72, *infra*.

- What channel spacing is needed to ensure appropriate voice quality and clarity for voice interoperability channels?
- Should the interoperability channels be spaced 25 kilohertz apart to more easily enable these channels to be incorporated into equipment operating in the 806-821 MHz band? Or should we consider a transition to 12.5 kHz channels for the 806-821 MHz band?
- What channel spacing is needed to ensure appropriate data capacity for data interoperability channels?
- To what extent might voice channels also be used by public safety personnel to carry data?

65. APCO and Powell discuss the use of 125 kilohertz channels for wideband data<sup>120</sup> and video transmissions. They indicate that, assuming a rate of 3 bits/sec/Hz, 125 kilohertz channels could provide for such transmissions at 384 kb/sec.<sup>121</sup> The PSWAC TESC indicates that a digital full motion video signal would require the transmission of approximately 1.5 Mb/sec. If such a signal could be transmitted at a rate of 3 bits/sec/Hz, then it could be delivered on a 500 kilohertz channel.<sup>122</sup>

66. We seek comment on what channel spacings should be adopted for voice, data, image/HSD, and video interoperability channels. We request that commenters consider the issues raised in Section II.B.1.c., *supra*<sup>123</sup> — e.g., the use of analog or digital technology, the appropriate data rates for different types of communications — and discuss their rationale in suggesting appropriate channel spacings for voice, data, image/HSD, slow motion video, and full motion video channels. We also ask commenters to indicate whether the channel spacings they suggest are based on current or future state-of-the-art technology in digital efficiency, as measured in bits/sec/Hz.

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<sup>120</sup> The term “wideband data” is defined by PSWAC to include the transmission of complex images, slow scan video, and fingerprint and identification information (e.g., mugshots). *PSWAC Final Report* at 56.

<sup>121</sup> See Powell Comments at 13; APCO Comments at 10. The Final Report of the PSWAC TESC indicates the following nominal transmission requirements: facsimile (1.87 Mb); mugshot (20 kb); fingerprint (24 kb); color snapshot (19.66 Mb); and slow-motion video (384 kb/sec) (using the ITU H.261 standard). *PSWAC Final Report* at 230-32.

<sup>122</sup> *PSWAC Final Report* at 232 (noting that the current state of the art for digital full motion video is set by the MPEG-2 standard at 1.5 Mb/sec.).

<sup>123</sup> Paras. 53-60, *supra*.

### e. Channel Requirements

67. We seek input from commenters regarding the number of interoperability channels that should be designated for each type of communication described above, and with regard to additional factors related to channelization, such as the number of paired or unpaired channels needed for the various types of communications. The PSWAC ISC suggests that 31 paired voice, 70 simplex voice, two independent high speed data, and two independent full motion video links should be provided for interoperability purposes from new public safety spectrum.<sup>124</sup> But, given that there is not an unlimited amount of spectrum available for interoperability, we seek comment on whether the Commission should decide how many channels are necessary to satisfy the needs of the public safety community for each type of interoperability communications. In connection with examining whether the number of channels necessary for each type of interoperability communications should be specified, we seek input from commenters on the configuration and number of channels that should be dedicated for interoperability.

68. With regard to voice channels, we seek input as to whether we should provide for a combination of one-way (mobile transmit-only) and two-way (base transmit and mobile transmit) voice channel pairs, as the PSWAC ISC suggests, or whether we should propose the allocation of strictly two-way channel pairs. In making this decision, we will consider the likely interoperability needs of public safety users. As indicated above,<sup>125</sup> there are a variety of voice interoperability communications — *e.g.*, dispatcher-to-dispatcher, dispatcher-to-field personnel, field personnel-to-field personnel (through a repeater, or directly). The latter, direct communication between personnel in the field, would simply involve the use of mobile transmit channels. Therefore, in providing for voice interoperability channels, we must consider whether we should designate some number of mobile transmit-only channels, or whether establishing the maximum number of two-way channel pairs is advisable to enable maximum support of mobile-repeater-mobile operation (when a repeater is available).

69. With regard to data, image/HSD, and video channels for interoperability, we believe it is also important to consider the anticipated nature of such communications — *i.e.*, will these types of communications originate from a base station<sup>126</sup> or from the field.<sup>127</sup>

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<sup>124</sup> PSWAC Final Report at 52.

<sup>125</sup> See para. 47, *supra*.

<sup>126</sup> See NASTD Comments at 8-10; PSWAC Final Report at 219 (noting the useful applications of still image transmission to the field in “allow[ing] the dispatcher to send pictures of missing children or of suspects to patrolling police officers or to send high-resolution diagrams of buildings and charts showing storage of hazardous materials to fire trucks . . .”).

Ultimately, we must decide how many one-way and two-way data, image/HSD, and video interoperability channels are desirable,<sup>128</sup> based upon the likely needs for interoperable communications.

70. We seek comment on the number of channels that commenters believe should be dedicated for interoperability uses for: voice transmissions (mobile-only, or base and mobile channel pairs); data transmissions (base-only, or base and mobile channel pairs); image/HSD transmissions (base-only, or base and mobile channel pairs); slow motion video transmissions (mobile-only, or base and mobile channel pairs); and full motion video transmissions (mobile-only, or base and mobile channel pairs). In commenting on the number of interoperability channels that should be designated, we ask that commenters also indicate the channel spacing they assume for each type of channel.

#### **f. Equipment Standards**

71. The *Public Safety Notice* raised the issue of whether the Commission should adopt “receiver standards” to ensure the quality of public safety radio receivers.<sup>129</sup> In the past we have generally relied on the market to address receiver standards. Nevertheless, we recognize that poor quality receivers could impede communications on the interoperability channels. Accordingly, we invite comment as to whether the Commission should establish receiver standards for the interoperability channels. Commenters should address the reasons for and against adopting such standards. Those commenters recommending mandatory standards should indicate the technical parameters to be standardized. We observe that the Commission’s authority to regulate receiver performance may be limited. We note, for example, that Section 302 of the Communications Act grants the Commission specific authority to regulate the susceptibility to interference of home electronic equipment such as TV receivers.<sup>130</sup> We request parties who favor mandatory receiver standards to address the Commission’s legal authority to adopt such standards.

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<sup>127</sup> *PSWAC Final Report* at 219 (noting useful applications of still image transmission from the field in “allow[ing] police officers to transmit photographs and fingerprints of suspects back to the office for processing, inspection by other officers, and comparison with materials in data bases.”). See also *id.* at 214 (noting applications of full motion video from the field to monitor wildland fire scenes from the air, for Federal law enforcement surveillance and for State and local transportation agencies’ detection of roadway hazards or collisions.).

<sup>128</sup> PSWAC, for example, appears to have recommended the allocation of one base/mobile pair of high speed data channels, and one base/mobile pair of full motion video channels. *Id.* at 52.

<sup>129</sup> *Public Safety Notice*, 11 FCC Rcd at 12484 (para. 68).

<sup>130</sup> 47 U.S.C. § 302(a).

72. In the *NPSPAC Order*, we decided that all mobile and portable radios operating on channels in the 821-824/866-869 MHz band must be capable of operating on the five mutual aid channels.<sup>131</sup> We seek comment regarding whether we should require that all public safety mobile and portable radios operating in the 746-806 MHz band be capable of operating on all voice and data interoperability channels in that band. In addition, we could also require that all public safety mobile and portable radios operating in the adjacent 806-824/851-869 MHz band be equipped for operation on these channels.<sup>132</sup> We invite comment regarding whether it is technically feasible to incorporate the 746-806 MHz interoperability channels into mobile and portable radios operating in the 806-824/851-869 MHz band, and whether doing so is dependent on whether we employ television Channels 68 and 69 (*i.e.*, frequencies in the 794-806 MHz band) for mobile-to-base transmissions (as proposed in Section II.F., *infra*)<sup>133</sup> or whether we decide instead to use television Channels 63 and 64 (*i.e.*, frequencies in the 764-776 MHz band) for some or all mobile-to-base transmissions. If incorporating 746-806 MHz interoperability channels into 806-824/851-869 MHz mobile and portable radios is technically feasible, commenters are asked to address whether we should require that all public safety mobile and portable radios operating in 806-824/851-869 MHz band manufactured or imported beginning one year after the effective date of the Report and Order adopted in this proceeding, be capable of operating on the interoperability channels in the 746-806 MHz band.

73. On the other hand, the best and easiest way to provide for mobile and portable radio equipment on these channels might be for equipment manufacturers to build "interoperability radios" (*i.e.*, radios that transmit and receive only on voice and data interoperability channels). Because all such radios would operate on the identical channels and have the same features, it might be better, from a technical or economic standpoint, for manufacturers to invest their resources in the production of these types of radios. If such radios could be manufactured at relatively low cost, then they could be made available to large numbers of local, State, and Federal public safety personnel throughout the Nation for use in both emergency and day-to-day interoperability.<sup>134</sup> We seek comment on this option,

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<sup>131</sup> *NPSPAC Report and Order*, 3 FCC Rcd at 908 (para. 28).

<sup>132</sup> See Section II.C.3.e., *infra*, paras. 156-158, regarding equipment standards for non-interoperability spectrum.

<sup>133</sup> Paras. 170-171, *infra*.

<sup>134</sup> The PSWAC ISC notes that a possible advantage of having separate radios that transmit and receive only on the interoperability channels is that they could be "small and low cost due to optimization to specific interoperability requirements." *PSWAC Final Report* at 321. It also indicates that separate radios are currently used by many agencies to achieve interoperability when users are operating on different frequency bands, and that the use by all agencies of a "separate emergency radio" operating on an interoperability band might

and on the trade-offs between this and the previous option (of requiring all radios to operate on the interoperability channels).

## 2. Eligibility, Use, and Licensing

### a. Definitions

74. In the *Public Safety Notice*, we tentatively concluded that we should adopt formal definitions relating to public safety.<sup>135</sup> In its *Final Report*, PSWAC also adopted these definitions.<sup>136</sup> We do not intend to take further action on the definitions we proposed, however, since in directing the Commission to assign 24 megahertz of spectrum in the 746-806 MHz band for public safety services, Congress defined “public safety services” to mean services:

“(A) the sole or principal purpose of which is to protect the safety of life, health, or property;

“(B) that are provided—

“(i) by State or local government entities; or

“(ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and

“(C) that are not made commercially available to the public by the provider.”<sup>137</sup>

75. We tentatively conclude that a definition of a “public safety services provider” can be based upon the statutory definition of public safety services, and that such a definition would be helpful in developing service rules for the 746-806 MHz band. We propose to define the term as follows:

Public Safety Service Provider: (1) A State or local government entity that provides public safety services; or (2) a non-

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therefore “actually reduce the number of radios required by some agencies. . . .” *Id.* at 332.

<sup>135</sup> *Public Safety Notice*, 11 FCC Rcd at 12470 (para. 25).

<sup>136</sup> *PSWAC Final Report* at 45.

<sup>137</sup> Section 337(f)(1) of the Communications Act, 47 U.S.C. § 337(f)(1), as added by the Balanced Budget Act of 1997, § 3004.

governmental organization that is authorized to provide public safety services by a governmental entity pursuant to Section 337(f)(1)(B)(ii) of the Communications Act.<sup>138</sup>

76. We note that two broad groups fall within this definition — governmental public safety services providers, and authorized non-governmental public safety services providers. We also note that many entities with public safety interests, and with which public safety service providers may from time to time need to communicate by radio, do not fall within the statutory definition. We believe that among these would be Federal agencies; those State and local entities, the sole or principal purpose of which is *not* to protect the safety of life, health, or property; and providers of commercially available public safety services. The public safety services definition has obvious bearing upon which groups may be eligible to use the interoperability channels, and which groups may be eligible to apply for channels from the public safety spectrum that is not reserved for interoperability. We discuss these issues in later sections of the Notice.<sup>139</sup>

#### **b. National and Regional Planning**

77. We here address how interoperability spectrum may best be managed for effective interoperable communications. Commenters have stated that, in emergencies, disciplined use of the interoperability channels will be of vital importance, and some even maintain that adequate planning for inter-communication may be as important as providing sufficient spectrum for the channels.<sup>140</sup> Whether portions of the interoperability spectrum should be set aside for certain kinds of use, such as mutual aid or task force, or for certain services, such as firefighting or law enforcement, and whether some providers' use of these channels should be limited to certain circumstances, are examples of the questions we will ask commenters to consider in the paragraphs below.

78. As a threshold question, however, we ask commenters to discuss which policies we should set at the national level, and which should be set by those in closer proximity to State and local public safety users. In the *NPSPAC Proceeding*, we established 55 regions within the United States and its territories, and directed each to develop plans for use of both

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<sup>138</sup> 47 U.S.C. § 337(f)(1)(B)(ii), as added by the Balanced Budget Act of 1997, § 3004.

<sup>139</sup> See Section II.B.2.d., *infra*, paras. 85-95, and Section II.C.2., *infra*, paras. 120-123.

<sup>140</sup> See, e.g., Kansas EMC Comments at 3; Dallas Comments at 4-5.

the interoperability and the non-interoperability channels.<sup>141</sup> Among their other responsibilities, the regions were to establish procedures for interoperability that would employ the channels in a way that best suited their individual communications requirements.<sup>142</sup> We could adopt a similar process for the interoperable channels in the 746-806 MHz band. A disadvantage of this approach may be that in the event of a large-scale emergency, such as a flood or a hurricane, it may be difficult rapidly to integrate public safety personnel from multiple Federal, State, and local agencies into a localized interoperability plan. We tentatively conclude that our primary goal with respect to interoperability should be seamless interoperability on a nationwide basis.<sup>143</sup>

79. We therefore request comment regarding four alternative approaches to managing the interoperability channels in the 746-806 MHz band. First, we ask commenters to consider whether the individual NPSPAC regional planning committees should be given oversight and responsibility for developing and adopting plans for various aspects of the operation and use of the interoperability channels in the 746-806 MHz band, such as the specific amounts of spectrum for particular categories of interoperability or for making the decisions governing access to the interoperability channels.

80. Second, as a variation on this approach, we ask commenters to consider whether the Commission should create parallel regional organizations devoted entirely to developing plans and procedures for use of the interoperability channels. For example, the PSWAC ISC Report suggests that the Commission and NTIA formally certify State or regional interoperability communications planning (ICP) organizations to develop operational procedures for interoperability channels.<sup>144</sup> We note that while these two options would give maximum flexibility to the individual regions, neither provides for management or oversight of the interoperability channels at the national level. We therefore ask commenters favoring either of these two options to discuss how management of the interoperability channels could be entrusted to the individual regions without compromising our goal of seamless nationwide interoperability.

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<sup>141</sup> Development and Implementation of a Public Safety National Plan and Amendment of Part 90 to Establish Service Rules and Technical Standards for Use of the 821-824/866-869 MHz Bands by the Public Safety Services (*NPSPAC Proceeding*), Memorandum Opinion and Order, GEN Docket No. 87-112, 3 FCC Rcd 2113 (1988) (*NPSPAC First Reconsideration Order*). Regional planning committees are discussed in Section II.C.1., *infra*, paras. 109-119, at greater length.

<sup>142</sup> See *NPSPAC Report and Order*, 3 FCC Rcd at 911 (para. 52).

<sup>143</sup> See para. 14, *supra*.

<sup>144</sup> *PSWAC Final Report* at 429.

81. The PSWAC ISC suggests a third alternative, the establishment of a national planning process to develop “a nationwide mutual aid plan, define operational policies and procedures, provide guidance and procedures for regional planning processes, and define incident command system requirements . . . .”<sup>145</sup> The PSWAC ISC envisions that all levels of government would participate in this effort, which would define guidelines which the regions could then use in addressing interoperability concerns and issues in their individual regional plans.<sup>146</sup> In this way, regions would still develop their own interoperability procedures, but would do so using a common framework that would promote interoperability among both resident and non-resident public safety users. We seek comment as to whether the Commission should adopt this third approach, and initiate a national planning process to develop specific nationwide plans and procedures for the interoperability channels, as proposed by the PSWAC ISC.

82. Finally, we ask commenters to discuss a fourth option in which specific nationwide guidelines and procedures concerning the use of the interoperability channels would be developed. These approaches may not be mutually exclusive, and the best solution to managing the interoperability spectrum may combine elements from the four approaches we have suggested. For example, the 55 regions may fit within a nationwide structure with four to six subdivisions, such as, northeast, southeast, central, west, and non-continental United States. We request commenters to consider these options, or a combination of these options, as well as any other alternatives, regarding the management of the interoperability channels in the context of the following issues: (1) the categories of interoperability uses; and (2) eligibility for use of interoperability channels.

### c. Categories of Interoperability Uses

83. In the *Public Safety Notice*, we discussed public safety interoperability in three general contexts: day-to-day, mutual aid, and emergency preparedness or task force operations.<sup>147</sup> The PSWAC ISC and the PSWAC Steering Committee also discuss interoperability needs in terms of these three contexts.<sup>148</sup> Thus, we consider whether it is necessary or advisable to provide specific amounts of spectrum for each of these categories of uses, or whether we should instead provide spectrum for general interoperability use. We invite comment regarding this issue. If commenters believe that interoperability channels

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<sup>145</sup> *Id.* at 52.

<sup>146</sup> *Id.* at 52, 428-29.

<sup>147</sup> *Public Safety Notice*, 11 FCC Rcd at 12472 (paras. 28-30).

<sup>148</sup> *PSWAC Final Report* at 19, 47.

should be designated for specific uses — *i.e.*, day-to-day, task force, and mutual aid — we ask them to suggest the appropriate number of channels for each. We ask commenters to include in their suggestions how many of each type of channel — *i.e.*, voice, data, image/HSD, or video — should be designated for each category.

84. We also ask commenters to consider whether, in the event of an emergency, all voice, data, image/HSD, and video interoperability channels should become mutual aid channels, so that all public safety users at the scene of an emergency would have at their disposal the full complement of interoperability channels. We also invite comment regarding the alternative approaches of allowing the regions, either individually or as participants in a national planning committee, to decide how many channels, and what kind of channels, should be used for each category of interoperability. If we permit the regions to decide these questions, we ask commenters to discuss whether the Commission should designate a minimum number of the interoperability channels for mutual aid and set their location. Our tentative view is that such an approach would ensure that immediately identifiable channels would be available for mutual aid in all regions of the Nation, and thus support our goal of achieving seamless nationwide interoperability.

#### **d. Eligibility and Use of Interoperability Channels**

85. We seek comment regarding which entities should be eligible to use each of the three proposed categories of interoperability channels. When the Commission designated spectrum in the 821-824/866-869 MHz band for public safety, it decided that licensees eligible in the Public Safety Radio Service and Special Emergency Radio Services would be eligible to use the mutual aid channels.<sup>149</sup> Here, however, Congress has directed the Commission to assign 24 megahertz of spectrum in the 746-806 MHz band for public safety services, as defined by the statute.<sup>150</sup> We are considering devoting a substantial amount of that spectrum for the sole purpose of promoting interoperability. Our goal in dedicating this much spectrum for interoperability is to permit a broad range of public safety-related entities to communicate with each other.

86. The PSWAC ISC states that interoperability among Federal, State, and local public safety agencies is essential for the protection of life and property, and reports broad

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<sup>149</sup> *NPSPAC Report and Order*, 3 FCC Rcd at 906-07 (para. 13).

<sup>150</sup> Section 337(f)(1) of the Communications Act, 47 U.S.C. § 337(f)(1), as added by the Balanced Budget Act of 1997, § 3004. See discussion at paras. 74-76, *supra*.

categories of agencies and other entities with interoperability needs.<sup>151</sup> Also, in certain emergencies, such as accidents involving railroads or the transportation of petroleum products, public safety service personnel may need to communicate with workers in industries that are not primarily engaged in public safety operations. In all, the PSWAC ISC identifies nine comprehensive categories — Federal Government, general government, criminal justice, fire and EMS, forestry-conservation, highway, Intelligent Transportation Systems (ITS), mass transportation, and public services — that require interoperable communications.<sup>152</sup>

87. DOT states that it agrees with PSWAC that interoperability among public safety agencies is an absolute requirement for both day-to-day and coordinated disaster-response operations, and observes that the need for interoperability includes both State and Federal entities, especially in emergencies.<sup>153</sup> Kansas-EMC stresses that it is necessary for different levels of government, such as the FBI and the county sheriff, to have interoperable wireless communications.<sup>154</sup> NYCT argues that the intensity of need may vary according to location or the type of activity, but at a minimum, the fire, police, and emergency medical “first responders” need constant access to direct communications.<sup>155</sup> Texas-DPS calls interoperability “the key issue” regarding protection of life and property, and states that interoperability “remains a concern for all agencies within public safety.”<sup>156</sup> Finally, we note that many commenters agree that commercial infrastructure providers such as utilities and railroads may need access to the interoperability channels during an emergency in which their facilities are directly involved.<sup>157</sup>

88. We tentatively conclude that all public safety service providers<sup>158</sup> should be eligible to use all of the interoperability channels. We also tentatively conclude, however, that eligibility alone will not guarantee an entity unlimited access to these channels, but rather

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<sup>151</sup> *PSWAC Final Report* at 45. Within the PSWAC ISC, Work Group 4 “discussed the idea of creating a ‘laundry list’ of entities, but felt that this might become restrictive and exclude vitally important entities in different regions of the country.” *Id.* at 293. *See also id.* at 32-33.

<sup>152</sup> *See id.* at 382-411.

<sup>153</sup> DOT Comments at 5-6.

<sup>154</sup> Kansas-EMC Comments at 2, 4.

<sup>155</sup> NYCT Comments at 5-6.

<sup>156</sup> Texas-DPS Comments at 1.

<sup>157</sup> DOT Reply Comments at 2-3.

<sup>158</sup> For our proposed definition of “public safety service provider,” see paras. 75-76, *supra*.

that use of interoperability channels will only be permitted in accordance with the plan for interoperability. We also believe that it would be consistent with the new Section 337 of the Communications Act and the intent of Congress to consider broadening the eligibility for interoperability channels in order to promote public safety. In the course of their duties, public safety service providers may need to interact with other public safety related entities, which provide services that do not fall within the definition of public safety services established by Congress in Section 337.

89. For example, public safety agencies may need to communicate with non-governmental workers during an industrial disaster, and during the aftermath of an incident such as the Oklahoma City Federal building bombing, State and local officials may need to maintain contact with Federal officials. We therefore invite commenters to consider whether entities which are not public safety service providers should also be eligible to use the interoperability channels. If we decide that these other entities should be eligible to use the interoperability channels, we ask commenters to consider the circumstances under which they should be permitted to use them.

90. As noted by the PSWAC ISC, there are no formal mechanisms currently in place to enable Federal users to operate on non-Federal Government spectrum. The PSWAC ISC therefore calls for regulations "to provide for equal access by both Federal and non-Federal agencies for purposes of interoperability."<sup>159</sup> As we discuss above, we tentatively agree that public safety service providers will need to communicate with their Federal counterparts, and we therefore seek comment regarding not only how the interoperability channels should be made available to Federal users, but also how the Table of Allocations may need to be revised to permit Federal use. Again, we also seek comment regarding whether rules permitting such use by Federal agencies would be consistent with congressional objectives in amending Section 337 of the Communications Act.

91. Unlike Federal agencies, and unlike those governmental agencies not solely or principally devoted to the protection of public safety, non-governmental organizations, under the terms of Section 337 of the Communications Act, may be considered to provide public safety services if they are so authorized by a government agency whose primary mission is the provision of such services.<sup>160</sup> We propose, therefore, that authorized non-governmental providers should not be treated as *guest* entities on the interoperability channels, but should instead be treated as being among the public safety service providers for whom the interoperability channels are specifically intended.

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<sup>159</sup> PSWAC Final Report at 313.

<sup>160</sup> See Section 337(f)(1)(B)(ii) of the Communications Act, 47 U.S.C. § 337(f)(1)(B)(ii), as added by the Balanced Budget Act of 1997, § 3004.

92. Nevertheless, we tentatively conclude that orderly and effective use of these channels would require that *all* users — State, local and Federal; governmental and non-governmental; those entities that are eligible by definition and those entities that may be eligible as guests — should be entitled to use the interoperability channels *only* in accordance with the interoperability plan. We further tentatively conclude that, in formulating such plans, the planners should have the latitude to restrict the use by any entity of any or all of the interoperability channels as much or as little as they judge necessary to ensure that these channels are put to effective use. We seek comment on these tentative conclusions.

93. We further ask commenters to address the question of whether the plans governing access to the interoperability channels should be designed by the individual regions, either through the regional planning committees or through regional committees established specifically to address interoperability, or whether at least some of these rules should be prescribed at the national level, either by the Commission or through a national interoperability planning committee. We ask commenters to consider the possibility that the rules determining access to some of the interoperability channels, such as the mutual aid channels or the task force channels, might be formulated by the Commission, while regional committees or other regional groups might formulate the rules governing access to the channels designated for day-to-day use. We also ask commenters to consider whether access by Federal agencies (if we conclude that such access is consistent with the terms of Section 337) should be regulated at the national level, with the rules governing access by other entities to be set at the regional level. Finally, we invite comment regarding whether standards and procedures should be adopted to ensure that the interoperability plans are reasonable, effective, and fair.

94. We also solicit comment regarding whether we should dedicate channels to specific services. Some of the voice interoperability channels could be made available solely for fire department and EMS licensees, for example, or reserved for State agencies, or placed at the disposal of a federation or other association of user groups. We ask commenters to discuss whether at least some channels should be designated for particular services on a nationwide basis, or whether all eligible entities should have access to all the channels within a given category. We ask commenters to include in their discussion whether the decisions regarding the provision of certain channels for particular services should be made by the regions individually, either through the regional planning committees or through regional committees established specifically to address interoperability; by a national interoperability planning committee; or by the Commission. We also remind commenters to consider the option of the Commission deciding these issues for some, but not all, of the interoperability channels.

95. We also invite comment regarding how the voice, data, image/HSD, and video interoperability channels should be assigned to licensees. In the *NPSPAC Report and Order*,

we decided that licensees would have to obtain authorizations for base and control transmitters operating on the five mutual aid channels,<sup>161</sup> but that public safety entities could operate mobile units and portables on the mutual aid channels without separate authorization as long as they were operating in accordance with an approved regional plan for the mutual aid channels.<sup>162</sup> We request comment regarding whether we should adopt this same approach for the licensing of all interoperability channels, or whether we should adopt an alternative approach, such as giving the regions more authority for the interoperability channels and allowing each region to authorize individual agencies to operate base stations without the need for separate station authorizations.<sup>163</sup>

### 3. Trunking on Interoperability Spectrum

96. In the preceding paragraphs we have discussed interoperability issues that could involve both national and regional planning. We now turn to interoperability issues of national scope that we believe are appropriately resolved by the Commission. We first discuss the issue of trunking on interoperability spectrum. We then consider technical standards for interoperability spectrum. We tentatively conclude that any trunking and technical standards for this spectrum should be set by the Commission at the national level. If each region were permitted to adopt its own trunking or other technical standards, the resulting incompatibility could defeat the very purpose of setting aside this spectrum solely for interoperability, which is to make possible seamless wireless communication among all public safety users, anywhere in the Nation.<sup>164</sup> We seek comment on this tentative conclusion.

97. As stated above, we propose to designate a substantial amount of the available 24 MHz of public safety spectrum in the 746-806 MHz band for interoperability.<sup>165</sup> This would be far more spectrum than we have ever before furnished for this purpose.<sup>166</sup> Even if we require all equipment operating on this spectrum to use identical analog or digital standards,

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<sup>161</sup> Base station operations on the mutual aid channels were to be in accordance with the mutual aid provisions of the licensee's regional plan. *NPSAC Report and Order*, 3 FCC Rcd at 909 (para. 34).

<sup>162</sup> *NPSAC Report and Order*, 3 FCC Rcd at 909 (para. 34).

<sup>163</sup> The PSWAC ISC recommends that the Commission and NTIA "freely license [interoperability] frequencies to all eligible public safety/service providers . . . ." *PSWAC Final Report* at 289.

<sup>164</sup> See para. 14, *supra*.

<sup>165</sup> See para. 44, *supra*.

<sup>166</sup> *PSWAC Final Report* at 3. In the *NPSAC Proceeding*, for example, we allocated only five 12.5 kilohertz channel pairs (*i.e.*, 125 kilohertz, total) for mutual aid in the 821-824/866-869 MHz bands. 47 C.F.R. § 90.617(a)(1).

however, we may not realize our goal of enabling users from different public safety agencies or from different parts of the Nation to communicate with one another in emergencies if we do not provide a means for effectively coordinating the use of the interoperability channels. For example, if we provide for 70 mobile channels and 31 base/mobile channel pairs for interoperability, as PSWAC ISC suggests, and a number of public safety personnel from different agencies converge at the scene of a burning building — each equipped with a radio capable of operating on these channels — a firefighter inside the building must know which channel to use to communicate with a police officer standing outside the building.<sup>167</sup> Similarly, emergency responders from different regions must be able to select effectively from among the many possible interoperability frequencies, or our goal of viable nationwide interoperability will not be achieved.<sup>168</sup>

98. The matter of facilitating interoperable communications was addressed in the NPSPAC Plan, where we stipulated that the 5 channel pairs dedicated to mutual aid would operate in the conventional (non-trunked) mode.<sup>169</sup> In a subsequent reconsideration proceeding, certain parties expressed the concern that mutual aid systems operating in the conventional mode would be operationally inferior to more sophisticated trunked systems. They asserted that “computer-controlled trunked systems are capable of dynamic regrouping of callers, positive identification of caller, and other capabilities not available to the dispatcher in a conventional system.”<sup>170</sup> We agree that these features enhance interoperable communications among local public safety agencies sharing a common infrastructure. For example, a shared, trunked system employed by public safety agencies in a particular area could register the radios used by all of their field personnel, by ID number, in a database, and the system could control and manage communications among such users. In the event that non-

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<sup>167</sup> The PSWAC ISC Report observes that “there have been several recent incidents in which users operating field units have complained about the inability to communicate with other ‘on-scene’ agencies, only to later discover that they unknowingly had a common channel available in their radios.” *PSWAC Final Report* at 297.

<sup>168</sup> The PSWAC ORSC provides several examples indicating the complexity of interoperability needs. “[I]n large scale incidents such as a forest fire, up to 150 separate voice paths may be needed to effectively direct and manage the fire-fighting effort. Coordination of these groups is critical as they may involve police, fire, ambulance, hospitals, utilities, and federal/state/local government responsibilities.” *Id.* at 31. “Especially in large disaster situations, the effective coordination of multiple agencies . . . and jurisdictions is largely dependent on interoperable communications systems . . . . The 1993 fire in Malibu, California, required 458 agencies from 12 states to bring it under control.” *Id.* at 32-33.

<sup>169</sup> *NPSPAC Report and Order*, 3 FCC Rcd at 908 (paras. 28-30).

<sup>170</sup> *Public Safety Protocol Order*, 4 FCC Rcd at 3875 (para. 9).

resident personnel entered the area during an emergency, their radio units could be added to the database.<sup>171</sup>

99. In the NPSPAC reconsideration proceedings, the Commission decided not to require a trunking standard for equipment operating in the 821-824/866-869 MHz band.<sup>172</sup> The Commission affirmed the NPSPAC decision that the five mutual aid channels could operate in the conventional mode, and that there would be no barrier to identification by the regional planning committees of additional mutual aid channels in their regions and provision of operational guidelines for their use.<sup>173</sup> The Commission believed that effective regional interoperability could be achieved through the use of the five conventional-mode mutual aid channels, and that adopting trunking standards for the entire 6 megahertz would entail an unacceptable delay in making the spectrum available for public safety use.<sup>174</sup>

100. In this proceeding, as we consider an amount of spectrum for interoperability that may greatly exceed the five NPSPAC mutual aid channels, it is appropriate to again weigh the desirability of mandating a trunking standard for equipment operating on this spectrum. In the NPSPAC proceeding, we considered the adoption of trunking standards on *all* of the channels in the 821-824/866-869 MHz band — *i.e.*, both the interoperability and non-interoperability channels.<sup>175</sup> In this proceeding, however, we are considering a designation of a substantial amount of spectrum solely for interoperable communications, and our paramount concern regarding rules for this spectrum must be the effective use of the spectrum for that purpose. We therefore consider, and seek comment on, the specific question of adopting a trunking standard for the channels devoted to interoperability.

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<sup>171</sup> *PSWAC Final Report* at 332.

<sup>172</sup> *Public Safety Protocol Order*, 4 FCC Rcd at 3879-80 (paras. 37-38).

<sup>173</sup> *NPSPAC Report and Order*, 3 FCC Rcd at 908 (paras. 28-30).

<sup>174</sup> *Public Safety Protocol Order*, 4 FCC Rcd at 3879 (para. 31).

<sup>175</sup> *See generally id.* at 3874 (paras. 1-3); Advanced Technologies for the Public Radio Services, GEN Docket No. 88-441, Further Notice of Proposed Rulemaking, 4 FCC Rcd 8519 (1989); Technical Compatibility Protocol Standards for Equipment Operating in the 800 MHz Public Safety Bands, GEN Docket No. 87-112, Notice of Inquiry, 3 FCC Rcd 5399 (1988); Development and Implementation of a Public Safety National Plan and Amendment of Part 90 to Establish Rules and Technical Standards for Use of the 821-824/866-869 Bands by the Public Safety Services, GEN Docket No. 87-112, Memorandum Opinion and Order on Reconsideration, 3 FCC Rcd 5391 (1988).

101. In a large-scale emergency, wireless communication among many personnel from different agencies and regions must be rapidly coordinated.<sup>176</sup> We tentatively conclude that a trunked system is the best, and possibly the only practicable, method by which this goal can be achieved. A trunking standard would allow all radios to communicate with one another in the trunked mode, and would permit the quick and flexible establishment of talk groups that could include the radios of different local public safety agencies or of extra-regional agencies.<sup>177</sup> Such capability appears essential to managing emergency communications among users from many public safety agencies and jurisdictions. Further, trunking can offer additional capabilities and features, such as automatic identification of the caller, that could be of great benefit to public safety users, especially in emergency response situations, where the need to act quickly and with minimum confusion may be of the essence.<sup>178</sup> Also, while the amount of spectrum we propose for interoperability is substantial, it is not inexhaustible. Thus, because trunking technology makes for efficient use of the spectrum, requiring trunking would maximize the capacity available for interoperability.<sup>179</sup>

102. We have not heretofore required use of specific trunking standards for public safety communications services, and we note that we have not specified such standards for private or commercial mobile radio services either. However, interoperability among public safety users could be thwarted absent a trunking standard. It also is vitally important that the public safety spectrum be used in the most efficient way feasible.<sup>180</sup> For these reasons, as well as the operational benefits that trunking technology can provide, we ask whether we should adopt a trunking standard for communications on the interoperability channels. Because our goal is to promote the ability of public safety users to communicate across regional as well as across agency lines, we ask whether we should mandate a single nationwide trunking standard, rather than leave to the individual regions the decision of whether to employ conventional or trunked operations, or of selecting regional trunking standards.

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<sup>176</sup> Interagency planning and coordination are crucial for the successful use of the interoperability channels. See, e.g., Kansas-EMC Comments at 35; Dallas Comments at 3; Texas-DSP Comments at 20.

<sup>177</sup> As the PSWAC ISC has noted, if the equipment of non-resident agencies is not fully compatible with a local system infrastructure, then, in an emergency, non-resident and local personnel would not be able to communicate with one another effectively. The PSWAC ISC further indicates that land mobile radio equipment produced for the public safety market in the 800 MHz band by the three major U.S.-based equipment manufacturers "is not compatible in the analog trunked mode." *PSWAC Final Report* at 356.

<sup>178</sup> *Public Safety Protocol Order*, 4 FCC Rcd at 3875 (para. 9).

<sup>179</sup> See, e.g., *Refarming Second Report and Order*, at paras. 56-57.

<sup>180</sup> See para. 17, *supra*.

103. We seek comment on the various advantages and disadvantages of requiring use of trunking technology on the interoperability channels and our adoption of a standard. Commenters who believe it would be sufficient to require only use of conventional analog technology on the interoperable channels, as we require for the five mutual aid channels in the 821-824/866-869 MHz band, should suggest viable alternatives by which the large number of designated interoperability channels anticipated for this spectrum could be managed in emergencies. In addition, we invite such commenters to address the impact that lack of a trunking standard may have on the amount of spectrum that could be dedicated to interoperability.

#### 4. Technical Standards for Interoperability Spectrum

104. We recognize that adoption of technical standards poses formidable challenges. With regard to trunking standards, multiple standards are currently in use. Thus, selecting a trunking standard may exacerbate the problem of "backward compatibility" with existing systems. Further, the various manufacturers use proprietary trunking technology.<sup>181</sup> As a result, prior efforts to achieve industry and user consensus on a trunking standard have been largely unsuccessful. Further, such efforts to establish standards have led to strong disagreements over complex matters such as intellectual property rights and technical barriers to trade. With regard to digital standards, APCO Project 25 has been involved in a lengthy process to develop such standards for public safety equipment in the 800 MHz band — a process that has not been without controversy.

105. Accordingly, we request comment regarding how technical standards should be developed for interoperability channels. Our preference would be to rely on equipment manufacturers to develop standards through an appropriate standards association such as the Mobile and Personal Communications Division of the Telecommunications Industry Association (TIA). TIA, which is accredited by the American National Standards Institute (ANSI), would, through a fair and open process, produce standards which could then be adopted by the Commission.<sup>182</sup> Alternatively, the Commission could adopt standards

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<sup>181</sup> The PSWAC ISC observes that "[a]s manufacturers introduced new features and functions within the radio system, many of which were proprietary and are not available to other manufacturers, the interoperability problem was amplified." The PSWAC ISC points out that trunking systems, in particular, "utilized proprietary technology" and therefore "equipment was not compatible among different manufacturers." *PSWAC Final Report* at 298.

<sup>182</sup> TIA Comments at 2-3, 6-8; see also AMERICAN NATIONAL STANDARDS INSTITUTE, PROCEDURES FOR THE DEVELOPMENT AND COORDINATION OF AMERICAN NATIONAL STANDARDS (Mar. 1997).

developed by a public safety organization such as APCO Project 25.<sup>183</sup> If standards to be adopted by the Commission were developed by a group not accredited by ANSI, we would propose to require that group to use open and fair processes similar to those identified in Section 273(d)(4) of the Communications Act<sup>184</sup> in the development of such standards.<sup>185</sup> Another option would be for the Commission to adopt existing standards, such as the European TETRA standard, with any necessary modifications for the 746-806 MHz band.<sup>186</sup> Another approach would be for the Commission to create an industry advisory committee, and require that it develop standards within a certain period of time.<sup>187</sup>

106. We invite comment regarding the advantages and disadvantages of these various approaches to development of digital or trunking standards for interoperability channels. We are particularly interested in views concerning the option that would have the most likelihood of successfully meeting the needs of the public safety community. Further, we seek to underscore that it is our intent to initiate licensing of the public safety spectrum as soon as practicable. Therefore, we request comments as to the approach to development of standards for interoperability spectrum that is likely to be the most expeditious.

107. We appreciate that in addition to a basic trunking standard for interoperability channels, related technical standards — *e.g.*, standards that would enable priority access to be established on all radios, and allow radios to be configured into talk groups — may be

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<sup>183</sup> The Project 25 Steering Committee includes representatives of APCO; the National Association of State Telecommunications Directors (NASTD); NTIA; and the National Security Agency (NSA); and State and local officials. Project 25 Steering Committee Comments at 1.

<sup>184</sup> 47 U.S.C. § 273(d)(4).

<sup>185</sup> See Public Notice, FCC 96-403, WT Docket No. 96-86, released Oct. 9, 1996. In that Public Notice we stated our belief that Section 273(d)(4) applies specifically to wireline telecommunications equipment, but sought comment regarding whether the principles of that section might nonetheless be useful in the future development of public safety equipment standards. Comments were divided over whether the Commission should, or may, impose such procedural requirements on the development of *voluntary* technical standards for public safety equipment by non-ANSI accredited standard-setting organizations. Even commenters who dispute the Commission's authority to impose procedural requirements on the development of voluntary standards, however, do not dispute the Commission's authority to impose procedural requirements on the development of *mandatory* standards that the Commission intends to adopt. See, *e.g.*, APCO Comments at 30; Cal. Telecom. Comments at 23; Motorola Comments at 12-13.

<sup>186</sup> The advantages ascribed to the TETRA standard are set forth in the Strategic Policy Research Reply Comments, Attach. A.

<sup>187</sup> The PSWAC ISC states that any digital standards for interoperability should be developed and adopted in an open and fair process. *PSWAC Final Report* at 53.

required to enable effective interoperability.<sup>188</sup> In addition, common encryption standards may be desirable for public safety communications on all types of interoperability channels. We therefore invite comments as to the scope of any such additional standards that may be needed to ensure effective interoperability and how such standards should be developed. We also invite comment regarding what elements these standards should encompass.

### C. General Service Rules

108. We turn now from the service rules for the portion of the public safety spectrum designed to promote interoperability to similar issues related to service rules for the remainder of the public safety spectrum in the 746-806 MHz band. For these general service rules, our primary concerns are to alleviate the shortage of channels available to public safety agencies for their internal use and to provide spectrum for new types of communications, such as image and video. We begin by reviewing the approach the Commission took when it adopted the *NPSPAC Report and Order* and allocated six megahertz of spectrum for public safety in the 821-824/866-869 MHz bands. We then discuss and seek comment regarding the role of the regional planning committees, and finally turn to issues dealing with the provision and use of the public safety spectrum in the 746-806 MHz band.

#### 1. Regional Planning Committees

109. In 1986, the Commission allocated six megahertz of spectrum in the 821-824/866-869 MHz bands nationwide for public safety use.<sup>189</sup> In the *NPSPAC Report and Order*, the Commission indicated that this spectrum was to be utilized in the context of a National Plan and that the spectrum would not be made available for assignment until the National Plan was developed.<sup>190</sup> Active public safety involvement in the design of such a plan was deemed essential, and to that end the Commission, in December 1986, established NPSPAC to coordinate the involvement of public safety agencies in these planning efforts.<sup>191</sup>

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<sup>188</sup> APCO Project 16 developed such performance standards, which are used today in trunked public safety equipment operating in the 800 MHz band. *See generally Public Safety Protocol Order*.

<sup>189</sup> Amendments 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 Reserve Band for Private Land Mobile Use, Amendments 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 Nos. 84-1231, 84-1233, and 84-1234, Report and Order, 2 FCC Rcd 1825, 1838 (para. 99) (1986).

<sup>190</sup> *NPSPAC Plan NPRM*, 2 FCC Rcd at 2869 (para. 2).

<sup>191</sup> *Id.* at 2869, 2873 (para. 3) (App. A).