Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	PS Docket No. 06-229
Implementing a Nationwide, Broadband,	)	DA 10-1877
Interoperable Public Safety Network in the	)	
700 MHz Band	)	

REPLY COMMENTS OF T-MOBILE USA, INC.

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T-Mobile USA, Inc. ("T-Mobile") hereby submits these reply comments in response to the initial comments of others in connection with the above referenced *Public Notice* issued by the Federal Communications Commission ("FCC" or "Commission") regarding the feasibility of permitting the flexible use of the 700 MHz narrowband spectrum.[1/] T-Mobile advocates the *flexible* use of the current narrowband spectrum; it does not suggest, nor did the *Public Notice* contemplate, that the FCC mandate broadband operations in 700 MHz narrowband spectrum. Public safety entities should have the *flexibility* to upgrade narrowband spectrum to broadband use when they believe it appropriate. Establishment of a transition band plan now, and cooperation among public safety entities after the establishment of that band plan, will allow those areas that wish to use narrowband spectrum for broadband applications to do so, without negatively affecting entities that continue to use the spectrum for narrowband operations. The alternative – denying public safety entities access to broadband spectrum and, worse, allowing the narrowband spectrum to remain fallow instead – would be contrary to the public interest.

[1/] *Public Safety and Homeland Security Bureau Seeks Comment on the Technical and Operational Feasibility of Enabling Flexible Use of the 700 MHz Public Safety Narrowband Allocation and Guard Band for Broadband Services*, Public Notice, 25 FCC Rcd 13634 (2010).

I. INTRODUCTION AND SUMMARY

In its comments, T-Mobile pointed out that the most efficient use of the 700 MHz public safety spectrum is the deployment of a densely-built, interoperable broadband network.[2/] In order to facilitate migration to that optimal architecture, the Commission should permit public safety entities the flexibility to employ broadband applications on the spectrum specified for narrowband use. T-Mobile demonstrated that the use of broadband applications will likely become more prevalent than narrowband operations in coming years, and that flexibility will permit those first responders who wish to keep pace with technology to do so without the need for further Commission or legislative action.[3/] T-Mobile also pointed out that permitting flexible use of 700 MHz narrowband spectrum will not compromise public safety agencies' ability to satisfy their voice communications needs.[4/] Finally, T-Mobile demonstrated that Commission policy supports technical flexibility, provided that it does not result in harmful interference, and that this long-standing policy should be extended to 700 MHz public safety narrowband spectrum.[5/]

Numerous entities submitted comments opposing the flexible use of public safety 700 MHz narrowband spectrum.[6/] Those entities principally argue that (1) public safety entities

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2/ Comments of T-Mobile USA, Inc., PS Docket No. 06-229, at 3 (filed Dec. 3, 2010) ("T-Mobile Comments").

3/ T-Mobile Comments at 4-6.

4/ T-Mobile Comments at 7-8.

5/ T-Mobile Comments at 6-7.

6/ *See, e.g.*, Comments of Motorola, Inc., PS Docket No. 06-229 (filed Dec. 3, 2010) ("Motorola Comments"); Comments of the American Association of State Highway and Transportation Officials, PS Docket No. 06-229 (filed Dec. 3, 2010) ("AASHTO Comments"); Comments of the Telecommunications Industry Association, PS Docket No. 06-229 (filed Dec. 3, 2010) ("TIA Comments"); Comments of Andrew Seybold, PS Docket No. 06-229 (filed Nov. 29, 2010) ("Seybold Comments"); Comments of the Association of Public-Safety Communications Officials-International, Inc., PS Docket No. 06-229 (filed Dec. 3, 2010) ("APCO Comments"); Comments of AT&T, Inc., PS Docket No. 06-229 (filed Dec. 3, 2010) ("AT&T Comments"); Comments of Harris Corporation, PS Docket No. 06-229 (filed Dec. 3,

require narrowband spectrum for voice and low-speed data needs[7/]; (2) the use of narrowband spectrum for broadband applications will cause harmful interference to one or both systems[8/]; (3) flexibility will negatively impact public safety entities' interoperability plans[9/]; or (4) flexibility will strand the investment that public safety entities have already made in narrowband systems.[10/]

All of these concerns, however, are premised on a *mandatory* migration of narrowband spectrum to broadband. However, no mandatory repurposing of 700 MHz public safety

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2010) ("Harris Comments"); Comments by King County, Washington on the Technical and Operational Feasibility of Enabling Flexible Use of the 700 MHz Public Safety Narrowband Allocation and Guard Band for Broadband Services, PS Docket No. 06-229 (filed Dec. 3, 2010) ("King County Comments"); Comments of Region 8 – 700 MHz Regional Planning Committee, PS Docket No. 06-229 (filed Sept. 28, 2010) ("Region 8 RPC Comments"); Comments of the Public Safety Spectrum Trust Corporation, PS Docket No. 06-229 (filed Dec. 3, 2010) ("PSST Comments"); Comments Submitted by the State of Delaware, State of Maryland, and Prince George's County, Maryland, PS Docket No. 06-229 (filed Dec. 3, 2010) ("Delaware, Maryland, and Prince George's County Joint Comments"); Comments of The National Public Safety Telecommunications Council, PS Docket No. 06-229 (filed Dec. 3, 2010) ("NPSTC Comments"); Comments of Region 49 Regional Planning Committee (Texas, Austin), PS Docket No. 06-229 (filed Dec. 3, 2010) ("Region 49 RPC Comments").

7/ *See, e.g.*, Motorola Comments at 9; Region 8 RPC Comments at 2; TIA Comments at 3-4; Seybold Comments at 6; APCO Comments at 2; AT&T Comments at 5; Delaware, Maryland, and Prince George's County Joint Comments at 12; Region 49 RPC Comments at 2; Comments of Ocean County, PS Docket No. 06-299 (filed Dec. 3, 2010) ("Ocean County Comments"); Comments of the Region 54 700 MHz Regional Planning Committee, PS Docket No. 06-229, at 1 (filed Dec. 3, 2010) ("Region 54 RPC Comments"); Comments of the Region 7 (Colorado) 700 MHz Regional Planning Committee, PS Docket No. 06-229, at 1 (filed Dec. 3, 2010) ("Region 7 RPC Comments").

8/ *See, e.g.*, Motorola Comments at 14-17; TIA Comments at 7-8; Seybold Comments at 4; AT&T Comments at 3-4; Harris Comments at 11-13; Region 8 RPC Comments at 4; King County Comments at 3-5; Region 49 RPC Comments at 2; Comments of Minnesota Emergency Communications Networks, PS Docket No. 06-229, at 2 (filed Nov. 30, 2010) ("Minnesota Emergency Communications Networks Comments"); Comments of Miami-Dade County, PS Docket No. 06-229, at 1 (filed Dec. 2, 2010) ("Miami-Dade Comments"); Comments by the Denver Regional Transportation District, PS Docket No. 06-229, at 2-3 (filed Dec. 3, 2010).

9/ *See, e.g.*, Motorola Comments at 6; APCO Comments at 2; AT&T Comments at 5; Harris Comments at 7-11; King County Comments at 5-6; PSST Comments at 3; NPSTC Comments at 6; Region 49 RPC Comments at 3; Region 8 RPC Comments at 2; Minnesota Emergency Communications Networks Comments at 1; Comments by the Region 43 700 MHz Regional Planning Committee, PS Docket No. 06-229, at 3 (filed Dec. 3, 2010); Comments of the Utah Communications Agency Network, PS Docket No. 06-229, at 2 (filed Dec. 3, 2010).

10/ *See, e.g.*, AASHTO Comments at 3; Motorola Comments at 4; TIA Comments at 8-10; APCO Comments at 3; AT&T Comments at 6; Region 8 RPC Comments at 4; King County Comments at 2; Region 54 RPC Comments at 1; Region 7 RPC Comments at 1.

narrowband spectrum for broadband use is proposed. Further, allowing public safety entities the flexibility to migrate, if they so choose, at the pace they elect will ameliorate the concerns noted above. T-Mobile recognizes the critical importance of narrowband voice communications for public safety entities, and the Commission should not take any action that would prematurely reduce the spectrum available for that application. However, a flexible approach, managed by public safety, for public safety, will create a path to broadband use of the narrowband spectrum in the future without requiring that use today.

II. PUBLIC SAFETY ADOPTION OF A FLEXIBLE USE BAND PLAN WILL ALLOW FOR FLEXIBLE MIGRATION

Many of the commenting parties argue that granting public safety entities the flexibility to migrate today's narrowband spectrum to broadband use will result in a patchwork of inconsistent spectrum utilization – with spectrum being used for narrowband purposes in some areas and the same spectrum being employed for broadband in others.[11/] The problems asserted by flexibility opponents can be eliminated by using a common transition band plan and responsible spectrum management techniques.

Today, as shown below in Figure 1, there are 960 narrowband channels, each 6.25 kHz wide, between 769 MHz and 775 MHz designated for base station operations.[12/] The guard band between the public safety broadband and narrowband blocks is between 768 MHz and 769 MHz. A transition band plan, which shifts that guard band, would permit more of the 700 MHz band to

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11/ *See, e.g.*, Seybold Comments at 4 (arguing that adopting flexible use for the narrowband spectrum "would provide a patchwork of broadband and narrowband systems across the United States"); Motorola Comments at 5 (stating that co-mingling broadband and narrowband technologies that are deployed with different network architectures in the same band will not maximize efficient use of the spectrum).

12/ The spectrum is paired with the band 799-805 MHz for mobile transmit operations. References in these reply comments to base station channels also include the corresponding mobile transmit frequencies.

be used for broadband operations (as opposed to narrowband) , *at the election of public safety entities*, while protecting geographically adjacent entities that wish to continue to use the spectrum in its current configuration.

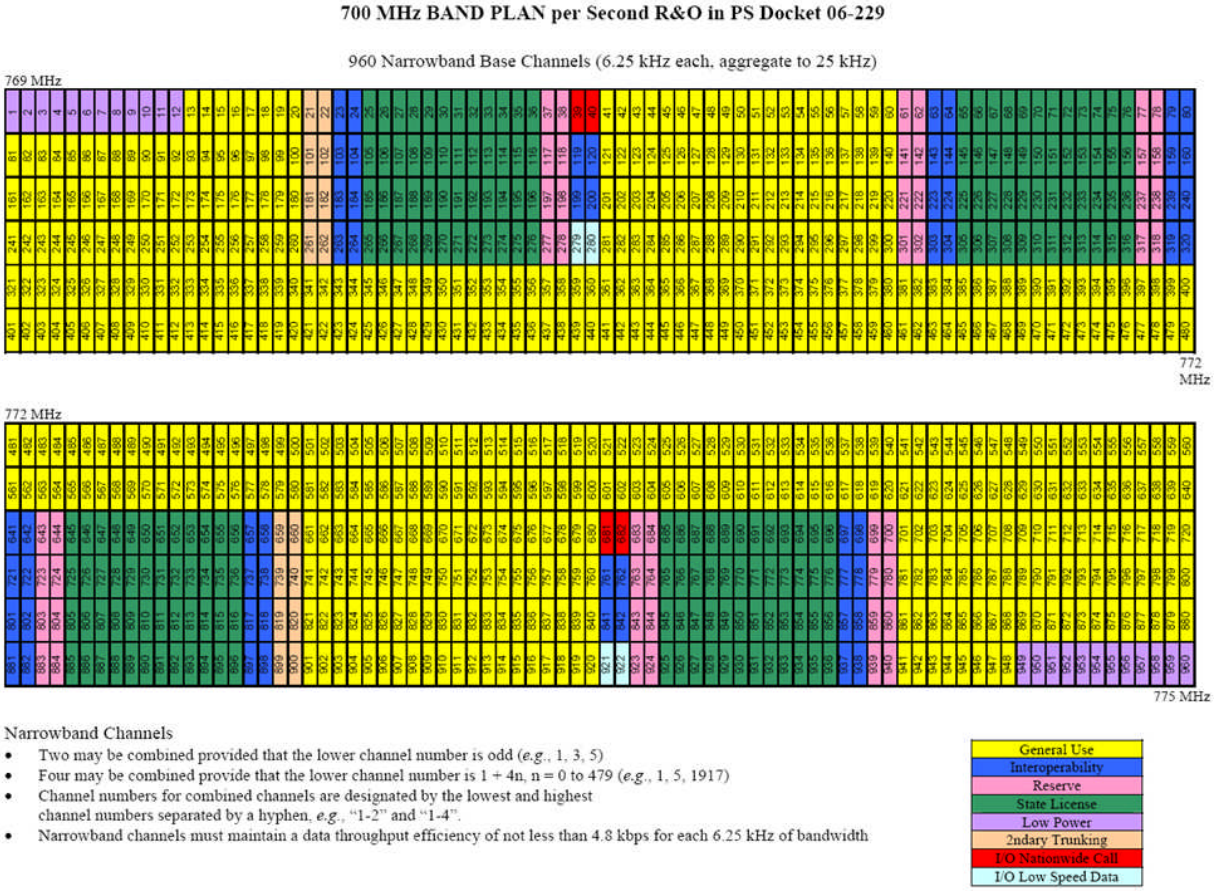

Figure 1. Current 700 MHz Band Plan

One such possible transition band plan is shown below at Figure 2. Under this formulation, when a public safety entity wishes to use narrowband spectrum for broadband applications, it could employ the band 768-773 MHz – a total of 5+5 megahertz – for broadband use. Those public safety entities that wish to use the spectrum for broadband applications would still have access to 160 narrowband channels between 774 and 775 MHz and there would be a new guard band between the broadband and narrowband segments at 773-774 MHz.

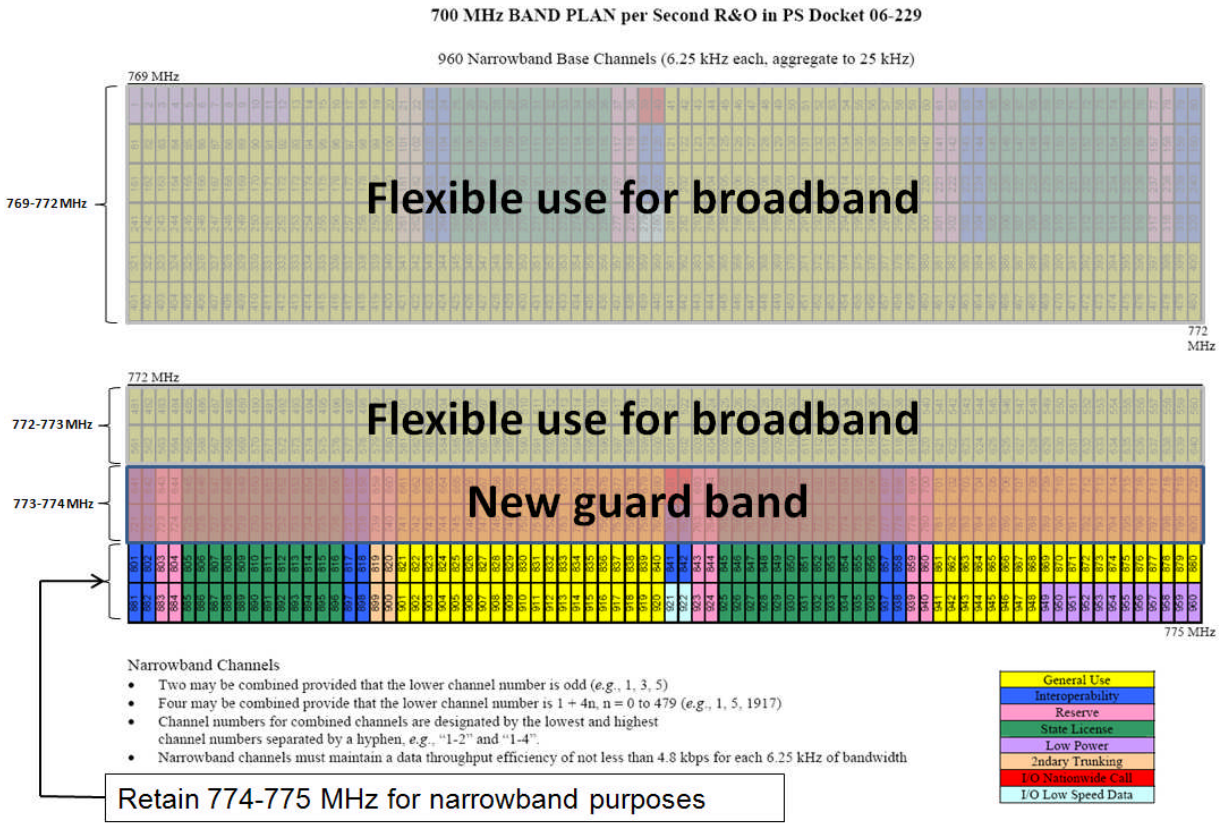

Figure 2. Potential Transition Band Plan for 700 MHz Narrowband Spectrum

This approach would continue to permit narrowband use of some of the current narrowband spectrum, even for those public safety entities that elect, at their option, to use most of the narrowband spectrum for broadband applications. As discussed further below, the spectrum that remains dedicated solely for narrowband use could be employed to satisfy legacy interoperable narrowband communications requirements for entities that use the majority of the 700 MHz spectrum for broadband applications and in the geographic buffer zones between entities with differing uses of the narrowband spectrum.

T-Mobile recognizes that the current 700 MHz band plan incorporates a spectrum guard band between the narrowband and broadband blocks to prevent interference when those blocks are used in the same geographic area. Today's band plan does not contemplate the use of

geographic separation between co-channel operations (except for those related to usual co-channel separation requirements) because the Commission's rules envision that the same technological platform will be used on all channels on a nationwide basis. However, and as Motorola pointed out, if today's narrowband spectrum can be used flexibly for broadband and narrowband applications, both a spectrum and geographic guard band, or buffer zone, is required.[13/] Public safety should be provided with the flexibility to determine the scope of that geographic buffer zone, which Motorola calculated to be as narrow as one mile between the same channels used for broadband in one area and narrowband in another.[14/] Under the proposal above, within that buffer zone, only the use of narrowband channels in the band 774-775 MHz would be available; broadband use of the remainder of the 700 MHz narrowband spectrum would be prohibited in the buffer zone. This approach would not only make 160 channels available for interoperable communications within the buffer zone, but it would also ensure that the public safety area with only narrowband operations would not receive or cause harmful interference to or from the adjacent area broadband system.[15/]

T-Mobile does not contemplate, as the Telecommunications Industry Association speculates, that there would be broadband "overlay" – the same spectrum used for both narrowband and broadband applications in the same geographic area.[16/] Instead, separation – both geographic and spectral – will afford protection to both narrowband and broadband operations. Planning for that separation today by adopting a transition band plan, geographic

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13/ Motorola Comments at 14-17; *see also* Seybold Comments at 13; AT&T Comments at 4; PSST Comments at 4.

14/ Motorola Comments at 17.

15/ Although the location of the buffer zone should be determined by the relevant public safety entities, T-Mobile expects that it would be within the coverage area of the agency that would otherwise use the remaining narrowband channels for broadband operations.

16/ TIA Comments at 7.

separation criteria, and other guidelines, will facilitate the more intense use of the entire public safety 700 MHz band in a way that satisfies multiple jurisdictions.[17/]

The separation of coverage areas of the narrowband and broadband users of the same (narrowband) spectrum through the use of a buffer zone is illustrated in Figure 3. On the right side of the figure, public safety Jurisdiction B has decided to deploy both broadband and narrowband systems at 700 MHz with the full complement of spectrum contemplated by the original 700 MHz public safety band plan, *i.e.*, with a 10 MHz (5 + 5 MHz) broadband network, and 960 narrowband channels. The geographic boundary within which Jurisdiction B uses all of the 960 narrowband channels is indicated by the dashed line. On the left side of the figure, public safety Jurisdiction A has elected to deploy an expanded, higher capacity broadband network using narrowband spectrum under a flexible use approach. This will allow Jurisdiction A to retain the use of 160 narrowband channels throughout its service area, while implementing a higher capacity, 20 MHz (10 + 10 MHz) broadband network in the majority of its service area (unshaded hexagonal cells). In order to prevent co-channel interference however, Jurisdiction A will not use the narrowband channels in the broadband cell sites in the boundary area (shaded hexagonal cells) between the two jurisdictions. Preventing the use of narrowband channels in the broadband cell sites at the boundary between the jurisdictions creates a "buffer zone" within Jurisdiction A, where the increased broadband capacity afforded by the use of the narrowband channels is not provided. The full capacity of the 5 + 5 MHz broadband spectrum is still available in this area, and the implementation of the buffer zone in a small portion of the area is a

[17/] The planned use of a buffer zone would, as Motorola points out, prevent entities using all of the narrowband spectrum for narrowband use from interfering with entities in adjacent jurisdictions using the same spectrum for broadband applications. *See* Motorola comments at 15-18.

desirable tradeoff to achieve higher broadband capacity in the majority of the service area of Jurisdiction A.

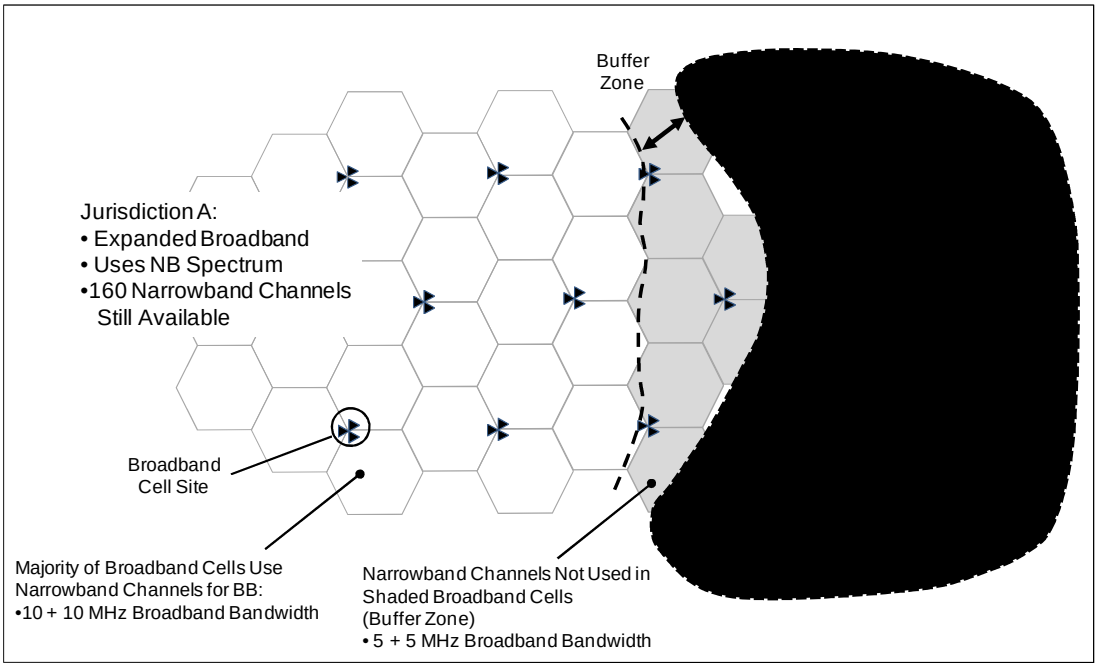

Figure 3. Illustration of Buffer Zones to Prevent Interference

The geographic extent of the buffer zone is determined by the radiofrequency ("RF") design parameters and characteristics of the narrowband and broadband networks (for example, the transmitter powers, antenna heights, sensitivity levels, interference tolerance), as well as the RF propagation characteristics in the geographic region where the networks are deployed. The buffer zone should be engineered during RF system layout to minimize the potential for interference in the situations noted by Motorola[18/]: (1) downlink interference by a narrowband base transmitter to a broadband user device receiver; (2) downlink interference by a broadband base transmitter to a narrowband device receiver; (3) uplink interference by a narrowband user device transmitter to a broadband cell site receiver; (4) uplink interference by a broadband user

18/ Motorola Comments at 16.

device to a narrowband base receiver. Initial analyses indicate that situation (3) – interference by a narrowband device transmitter to a broadband cell site receiver – will likely be the dominant case, because of the much higher level of transmit power of narrowband user devices compared to broadband devices, and the fact that narrowband user devices can operate at the boundary of their jurisdiction. As Motorola points out, a buffer zone of approximately 1.7 km would be required for a 1 km radius broadband cell to prevent interference in this case and the other cases as well.[19/] Therefore, the little impact that would be created by the use of narrowband spectrum for broadband application would be recognized by the entity electing flexibility, leaving the jurisdiction that elects to use the legacy band plan unaffected.

Critically, all of the decisions relevant to the deployment of a transition channel plan – including the distance between narrowband and broadband systems, when an area wishes to convert to broadband spectrum and other matters – should be managed by the public safety entities involved. The Commission has correctly entrusted Regional Planning Committees ("RPCs") with the task of creating plans for the use of both the 700 MHz and 800 MHz bands.[20/] The Commission can use the existing RPC structure to make the type of decisions and undertake negotiations with neighboring RPCs that foster flexible use of narrowband spectrum. Once a transition band plan and other migration criteria are established, RPCs – which best know the communications requirements of public safety entities in their areas – can facilitate the

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19/ Motorola Comments at15.

20/ *See, e.g., Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010*, First Report and Order and Third Notice of Proposed Rulemaking, 14 FCC Rcd 152 (1998); *Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010*, Second Memorandum Opinion and Order, 15 FCC Rcd 16844 (2000). A list of 700 MHz RPCs and region activities is available at http://www.fcc.gov/pshs/public-safety-spectrum/700-MHz/, and a list of 800 MHz RPCs and region activities is available at http://www.fcc.gov/pshs/public-safety-spectrum/800-MHz/.

introduction of broadband technologies on narrowband spectrum in a way that satisfies jurisdictions that wish to migrate to broadband as well as those that continue to rely on legacy narrowband technologies.[21/] Continued adherence to a command-and-control approach under which all jurisdictions are required to use all of the spectrum for what will ultimately become out-of-date narrowband technology is not in the public interest.[22/]

The contrary outcome – mandating yesterday's technology for tomorrow, as Sprint observed[23/] – is untenable. There certainly will be public safety entities that commit early to 700 MHz broadband and the potential that those entities will make little or no use of the spectrum reserved for narrowband operations. If the Commission does not provide those entities with the flexibility to use broadband technologies on narrowband spectrum, there will be *no use* of narrowband spectrum in their areas. Permitting flexibility will allow the spectrum to be used for broadband applications, satisfying critical public safety communications requirements, instead of remaining fallow. Because some entities assert that public safety requires additional broadband capacity,[24/] it would be counterintuitive and contrary to the public interest to deny them the ability to use spectrum already designated for public safety use for broadband applications in favor of simply allowing the spectrum to remain unused so that the narrowband band plan can be preserved – even where narrowband operations will not occur. Public safety cannot assert on the

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21/ *See* King County Comments at 6 ("RPCs have shown to be a valuable commodity in coordinating for effective use of both 700 and 800 MHz spectrum.").

22/ *See, e.g., Connecting America: The National Broadband Plan*, Federal Communications Commission, at 78-79 (March 2010) (finding that "the failure to revisit historical allocations can leave spectrum handcuffed to particular use cases and outmoded services"); *see also* Sprint Comments at 4.

23/ Sprint Comments at 3.

24/ *See, e.g., 700 MHz Broadband Public Safety Applications And Spectrum Requirements,* submitted by the City of New York, February 2010, available at http://fjallfoss.fcc.gov/ecfs/document/view?id=7020389715; *see also* Motorola Comments at 18 (advocating that the Commission provide more broadband spectrum for public safety by reallocating the Upper 700 MHz D Block); TIA Comments at 6.

one hand that they require additional broadband spectrum and at the same time fail to support the flexible use of narrowband spectrum that would make that broadband capacity available. Effective spectrum management and planning must be a critical component of meeting public safety spectrum requirements.

Motorola complains that adoption of a band plan – even on a flexible basis – would create a unique band that is not currently defined in the Third Generation Partnership Project ("3GPP"), and that it will be 2012 at the earliest before standards are established for use of this sub-band.[25/] Motorola is similarly concerned that allowing broadband use of narrowband spectrum will impact the duplexer spacing between the expanded public safety broadband spectrum and the upper 700 MHz C Block, potentially creating a unique spectrum block not supported in today's 3GPP configuration.[26/] Motorola's complaints are precisely the reason why a transition band plan that will accommodate broadband use on an elective basis should be adopted today – so that when the majority of public safety entities are prepared to migrate to advanced technology, technology issues will have been resolved and equipment for the band will be available. Failure to establish a band plan that permits voluntary migration will only delay equipment development for what will inevitably be broadband use of the spectrum.

Motorola's argument regarding the creation of an orphan 700 MHz public safety band is ironic.[27/] It and others advocate for the conversion of the 700 MHz D Block for public safety communications to create a public-safety only broadband system at 700 MHz, rather than using the D block for an incentive-based public-private partnership. Yet, converting the D Block for

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25/ Motorola Comments at 13; *see also* Seybold Comments at 2.

26/ Motorola Comments at 13 ("[T]echnical analysis and standards will be needed to determine the impact of reduced duplexer spacing between the combined public safety frequencies and the upper 700 MHz C Block (Band 13).").

27/ Motorola Comments at 18.

public safety use will also create an orphan band in which there will be no economies of scale or scope and public safety entities will continue to be limited to purchasing equipment that is more expensive and less feature-rich then commercially available equipment.[28/]

III. FLEXIBILITY WILL NOT DIMINISH PUBLIC SAFETY COMMUNICATIONS

A. Flexibility Will Not Reduce the Availability of Narrowband Spectrum

Some commenters believe that the FCC should not permit flexible use of the narrowband spectrum because narrowband spectrum is required to meet critical voice communications requirements.[29/] In due course, significant amounts of current public safety voice communications will be supported by broadband applications – either as voice carried on the broadband network or through text and data that, in some cases, may be more effective than voice. The Commission recently recognized that 911 emergency communications are unnecessarily limited by outdated digital and analog technologies and has begun to plan for next generation 911 systems that use a wider variety of technological platforms.[30/] A significant amount of narrowband voice and low-speed data applications will similarly be eclipsed over time

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28/ The PSST makes a similar ironic argument that providing flexible use would negatively impact equipment economies of scale because some public safety users would use the narrowband spectrum for broadband applications and others would not. *See* PSST Comments at 5-6. If public safety entities are truly interested in equipment economies of scale, they should enthusiastically support the auction of the D Block spectrum for commercial use in cooperation with public safety entities. Auction of the D Block spectrum for commercial operations in cooperation with public safety, producing 700 MHz bands capable of use by both commercial and public safety entities, will ensure that public safety entities enjoy both economies of scale and the most advanced, feature-rich devices that are offered by commercial providers. It is public safety's continued failure to endorse an incentive-based public-private partnership using D Block spectrum, and not flexible use of public safety narrowband spectrum, that will doom public safety to the current equipment marketplace dominated by a single provider of overpriced, out-of-date handsets.

29/ *See, e.g.*, Motorola Comments at 9 ("The importance of narrowband spectrum for mission-critical voice cannot be overstated."); *see also* Region 49 RPC Comments at 2; Ocean County Comments at 4; Delaware, Maryland, and Prince George's County Joint Comments at 12; Region 8 RPC Comments at 2.

30/ *See Framework for Next Generation 911 Deployment*, Notice of Inquiry, PS Docket No. 10-255, FCC 10-200 (rel. Dec. 21, 2010) (opening a proceeding to "gain a better understanding of how the gap between the capabilities of modern networks and devices and today's 911 system can be bridged").

by the use of more efficient and feature-rich technologies. Accordingly, as T-Mobile has pointed out, all of the current 700 MHz narrowband spectrum is not required for voice and low-speed data.[31/] Nevertheless, T-Mobile recognizes that there will remain a need for narrowband voice capacity. The transition band plan suggested above will accommodate narrowband voice applications for those entities that wish to use both narrowband voice and broadband applications at 700 MHz. Over the long term, other public safety bands can be used to support these requirements in an integrated broadband/narrowband unit.

T-Mobile recognizes that this transition will not occur immediately, and therefore all of the 700 MHz narrowband spectrum should continue to be made available to those jurisdictions that will not migrate quickly to 700 MHz broadband or that will not use other available public safety bands for narrowband communications. The decision whether to use narrowband spectrum for broadband technologies should be made by public safety entities. If entities wish to use all of their narrowband spectrum for voice and low-speed data, they should be permitted to continue to do so until they are ready to upgrade technologies. However, the 700 MHz narrowband spectrum should be available for broadband for those entities that will use other spectrum for narrowband voice or that require additional broadband capacity.

B. Flexibility Will Not Result in Harmful Interference to Narrowband Operations

Motorola, among others, argues that the introduction of broadband technologies in areas both spectrally and geographically adjacent to narrowband systems will result in harmful interference to narrowband operations.[32/] Motorola cites the example of commercial and public

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31/ T-Mobile Comments at 5, 8.

32/ *See, e.g.*, Motorola Comments at 14 (arguing that "permitting public safety to use the narrowband 700 MHz spectrum for broadband will increase the potential for interference"); *see also* TIA

safety systems operating at 800 MHz and asserts that the same interference experienced there will be replicated at 700 MHz.[33/] Motorola is wrong for several reasons. First, at 800 MHz, commercial and public safety channels were interleaved in the same geographic area. The interference between the two was ameliorated by creating spectral separation between the two systems.[34/] In this case, there is already spectral separation between narrowband and broadband systems in the same geographic area and the transition band plan proposed above would retain that spectrum guard band; at 700 MHz, the systems do not use and would not use interleaved spectrum.

Second, public safety will be able to engage in spectrum management techniques that ameliorate potential interference when the same spectrum is used for narrowband operations in one geographic area and broadband applications in another. As noted above, RPCs or other relevant entities can agree on a geographic buffer zone between all-broadband areas and locations where 700 MHz spectrum will continue to be employed for narrowband purposes. Within that buffer zone, only narrowband spectrum would be employed. Entities that wish to use the narrowband spectrum for broadband operations will plan for the existence of that buffer zone, likely within their area of operations, where no broadband operations would be permitted on narrowband channels, to prevent interference to their operations from narrowband users. In

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Comments at 7-8; Seybold Comments at 4; AT&T Comments at 3; Ocean County Comments at 7; Region 8 RPC Comments at 4; Miami-Dade Comments at 1.

33/ Motorola Comments at 14-15 ("The Commission could be creating similar conditions that existed in the 800 MHz band before reconfiguration should it allow broadband systems to operate in the narrowband allotment."); *see also* Harris Comments at 12; Region 49 RPC Comments at 2.

34/ In fact, by creating spectral separation, Sprint – the 800 MHz commercial provider – is now able to use more efficient broadband technologies, rather than the less efficient iDEN technology that previously characterized its use of the 800 MHz band. *See, e.g.*, Phil Goldstein, *Hesse: Sprint Will Eventually Shut Down iDEN*, FIERCE WIRELESS, Oct. 27, 2010 (reporting Sprint's movement away from its iDEN technology in favor of more robust technologies). The same result – the use of spectrally efficient broadband systems adjacent to narrowband systems – is possible at 700 MHz.

addition, public safety entities that use narrowband-only configurations can stage their use of the spectrum so that it is focused away from the spectrum border with broadband operations. With 960 narrowband channels, sound spectrum management techniques suggest that the first, or most heavily used channels, should be those that are furthest from a potential source of interference.

C. Flexibility Will Not Affect Existing Interoperability Plans

Commenting parties complain that allowing flexibility will hinder nationwide interoperability.[35/] There is nothing about allowing narrowband spectrum to be used on an elective basis for broadband applications – instead of potentially remaining fallow – that prevents public safety entities from pursuing interoperability plans. As noted above, migration to the use of broadband for all 700 MHz public safety entities would not be mandated – it would be an elective upgrade based on needs that public safety entities identify. If public safety entities believe that all of the narrowband spectrum is required today to support interoperable voice and low-speed data operations, then presumably no public safety areas will elect to convert narrowband spectrum for broadband use. On the other hand, if public safety entities believe (using the transition band plan suggested above) that only 160 channels, in addition to the narrowband spectrum available in other public safety bands, can serve interoperable narrowband and low-speed data operations, then some areas may wish to pursue conversion to broadband. However, those are decisions that the public safety community should be empowered to make on a region-by-region basis as broadband capacity needs evolve. The Commission should ensure that there is sufficient flexibility so that when an assessment of communications requirements

35/ *See, e.g.*, Motorola Comments at 6 (stating that flexible use of narrowband spectrum "could potentially foreclose the possibility of nationwide narrowband interoperability altogether"); *see also* Seybold Comments at 10; APCO Comments at 2; AT&T Comments at 5; King County Comments at 5; Region 49 RPC Comments at 3; PSST Comments at 3; Delaware, Maryland, and Prince George's County Joint Comments at 17-18; Region 8 RPC Comments at 2.

change, public safety entities will be able to use some of that spectrum for broadband operations.[36/]

Several other factors suggest that making more spectrum available for broadband operations will have no impact on interoperability. First, in the sample transition band plan outlined above, there would remain 160 channels available for interoperable and other forms of narrowband communications. Particularly in light of the migration to more advanced broadband technologies, it is likely that 160 channels of narrowband spectrum – along with the 700 MHz interoperable broadband spectrum – will be sufficient to support interoperable communications. Motorola cites to the 1996 Public Safety Wireless Advisory Committee ("PSWAC") report as support for the need for interoperable narrowband capacity.[37/] Referencing a more than 14 year old report as evidence of the need for narrowband interoperable spectrum is hardly compelling. At the time of the PSWAC report, there was no Long Term Evolution ("LTE") or other similar broadband technology. Any assessment made well over a decade ago about the need for narrowband technology, or any particular type of communications capability for that matter is, in light of the dramatic advances in wireless communications, of little value today. Many of the other conclusions of the PSWAC report have long been rejected. [38/] The report's conclusions

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[36/] *See also* Sprint Comments at 2 ("Offering greater flexibility in the 700 MHz band could provide additional capacity for either broadband or narrowband services.").

[37/] Motorola Comments at 7.

[38/] The report's assessments of the need for spectrum for narrowband data, status/message, wideband data, and special data have been superseded by both time and technology. *See* Public Safety Wireless Committee, *Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and the National Telecommunications and Information Administration*, at 55 (Sept. 11, 1996), *available at* http://www.ntia.doc.gov/osmhome/pubsafe/pswac_al.pdf. Ironically, the PSWAC report also identified the need for spectrum in the 4 GHz band to meet short-range video requirements, a need that parties claiming to speak in support of public safety now say cannot be supported in the 4.9 GHz band. *See* Letter from Andrew M. Seybold, CEO and Principal Analyst, Andrew Seybold, Inc., to Marlene H. Dortch, Secretary, FCC, WT Docket No. 06-150, PS Docket No. 06-229, GN Docket Nos. 09-47, 09-51, 09-137, RM Docket No. 11592, at 5-6 (filed Sept. 10, 2010).

about narrowband voice channels should be rejected, or at lease reexamined, in light of developments that have occurred over the past 14 years as well. Similarly, those commenters who assert that narrowband voice capacity is the most pressing public safety need[39/] fail to take into account technological changes. Even if those assessments of public safety requirements today are accurate, cementing today's needs on tomorrow's spectrum configuration by failing to permit flexible use of the 700 MHz narrowband spectrum is not in the public interest.

Second, it is anticipated that most interoperable communications will occur on *broadband* spectrum in the future.[40/] As T-Mobile pointed out, and public safety entities confirm, narrowband spectrum will most likely be used for off-network, on-scene communications.[41/] The talk-around capabilities that public safety entities require need not be satisfied with 700 MHz spectrum – public safety has access to spectrum in other bands. Even if 700 MHz narrowband spectrum is required for off-network, on-scene communications, public safety will likely discover that 960 channels for that purpose is not necessary.[42/]

39/ *See, e.g.*, Harris Comments at iii ("Public safety mission critical voice is the lifeblood of public safety and will continue to be for the foreseeable future."); *see also* TIA Comments at 3; Seybold Comments at 6; APCO Comments at 2.

40/ *See, e.g.*, *The Public Safety Nationwide Interoperable Broadband Network: A New Model for Capacity, Performance and Cost*, FCC White Paper (June 2010), *available at* http://fcc.gov/pshs/docs/releases/DOC-298799A1.pdf (assessing the broadband spectrum needs of the public safety community).

41/ T-Mobile at 3; Dennis A. Roberson, *Technical Analysis of the Proposed 700 MHz D-Block Auction*, at 11-12, filed as an attachment to Letter from Thomas J. Sugrue, Vice President Government Affairs, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, PS Docket No. 06-229 (Aug. 24, 2010) (summarizing and assessing the amount of narrowband spectrum available to public safety); APCO Comments at 2 (stating that narrowband spectrum is critical for on-scene tactical communications); Harris Comments at 5 (recognizing that narrowband systems have been built to meet the specific voice and low-speed data needs of public safety, including applications such as talk-around and push-to-talk).

42/ *See, e.g.*, TIA Comments at 6 (recognizing the importance of the narrowband spectrum to provide "talkaround" communications); Harris Comments at 4-5 ("Dedicated narrowband spectrum is critical to preserve the integrity of public safety communications and meet the operational and interoperability needs of public safety."); PSST Comments at 6 (finding that narrowband spectrum is needed because "it is premature to assume that broadband is a viable replacement for narrowband voice operations"); Minnesota Emergency Communication Networks at 7 ("Until such time as broadband

Third, as T-Mobile demonstrated, even if there are needs for interoperable narrowband spectrum, those needs can be satisfied by spectrum in other bands.[43/] Motorola, for example, notes that it is producing handsets with functionality in both the 700 and 800 MHz bands.[44/] Therefore, the public safety community can designate some 800 MHz channels as narrowband interoperable spectrum, which can be used in connection with 700 MHz narrowband spectrum to meet interoperable voice needs. Even other bands can be used in connection with the 700 MHz narrowband spectrum for narrowband requirements. Commercial providers offer handsets that house multiple bands in a single radio at a fraction of the size and price, with more functionality, than public safety radios.[45/] If the public safety community is willing to designate spectrum in all of these bands for interoperable narrowband voice, manufacturers can produce multi-band radios for public safety needs and reduce reliance on 700 MHz to satisfy those requirements.

D. Flexibility Will Not Strand Public Safety Investment

Some commenters assert that, by permitting flexible use of the 700 MHz public safety narrowband spectrum, public safety entities will lose the investment that they have made in

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networks can fully reproduce the function of narrowband networks in a cost-effective and value-added manner, narrowband networks will continue to be the best solution for public safety mission-critical voice communications."); T-Mobile Comments at 3-5 (showing the migration of public safety communications to broadband technologies) and 8 (illustrating that first responders have existing narrowband spectrum allocations to meet localized off-network narrowband voice needs).

43/ T-Mobile Comments at 8.

44/ Motorola Comments at 9 n.19 ("For its part, all new Motorola subscriber models since 2001 that support 800 MHz also support 700 MHz . . .").

45/ *See, e.g.*, Linda K. Moore, *Public Safety Communications and Spectrum Resources: Policy Issues for Congress*, Congressional Research Service, at 8 (Sept. 1, 2010) (finding that interoperable radios for 700 MHz narrowband networks each cost $3,000 and up, whereas commercial high-end mobile devices cost approximately $500); Cecilia Kang, *FCC, Public Safety Groups at Odds over Control of Nationwide Wireless Network*, WASH. POST, June 9, 2010 (reporting that the "FCC has also made it a goal to bring down the price of public safety devices from an average of $5,000 to prices more like those for high-end smartphones").

narrowband technology.[46/] As T-Mobile points out above, no public safety entity will be required to relocate from its current narrowband spectrum. In the representative transition band plan above, areas that wish to use all 960 narrowband channels for voice and low-speed data can continue to do so.[47/] Therefore, no public safety entity will lose any investment made in narrowband technology. By providing flexibility, however, the Commission would permit those entities willing to make the investment in more broadband spectrum the ability to do so.

Similarly, some commenters assert that allowing flexible use would create regulatory uncertainty and further delays in an already time-intensive spectrum planning process.[48/] As the Commission found in 2007, however, "the costs and inconveniences" of the narrowband spectrum planning process "are minor compared to the relative potential for accommodating future technologies."[49/] This principle remains true today. Public safety should not reject the flexible use of spectrum that will be used with advanced technology tomorrow because of the planning required today. With appropriate planning and the adoption of a well-designed transition band plan, spectrum that would otherwise potentially be fallow today could be used to satisfy critical public safety requirements with advanced communications capabilities, while still allowing those choosing to utilize legacy technology the option to use the same spectrum in the interim.

46/ *See, e.g.*, AASHTO Comments at 3 ("There was a general consensus any repurposing of allocated channels would require each state to scrap their approved communications plans and undergo the expense of reconvening focus groups to determine user needs and requirements for wide and broadband data in the narrowband voice spectrum"); *see also* TIA Comments at 8-10; APCO Comments at 3; King County at 2; Region 8 RPC Comments at 4.

47/ Geographic separation from areas using the spectrum for broadband use and spectrum planning that uses frequencies furthest away from broadband spectrum first and most intensely will protect these entities from interference.

48/ *See, e.g.*, Harris Comments at 8-9; NPSTC at 6-7; Ocean County at 8.

49/ *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands; Implementing a Nationwide, Broadband Interoperable Public Safety Network in the 700 MHz Band*, Second Report and Order, 22 FCC Rcd 15289, ¶ 345 (2007).

IV. CONCLUSION

Allowing flexible use of the 700 MHz narrowband spectrum would give public safety entities the opportunity to migrate their communications systems to broadband if they so choose, thus maximizing the use of this valuable spectrum. In addition, providing public safety agencies with the option to utilize this narrowband spectrum for broadband in the manner that T-Mobile suggests would not reduce the availability of spectrum for critical voice communications, would not cause harmful interference to narrowband or broadband operations, would not affect interoperability plans, and would not thwart existing investment. Accordingly, the FCC should allow public safety entities the option of using the 700 MHz narrowband spectrum for broadband operations.

Respectfully submitted,

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