

B. Affected 2 GHz Users Support Adoption of the Reallocation and Channelization Plan Proposed in the FNPRM.

It is noteworthy that 2 GHz users, which generally did not support the emerging technologies reallocation and which will be more adversely affected by this change than any other constituency, advocate adoption of the reallocation and channelization plan proposed in the FNPRM. API characterizes this plan as "viable" and "useful" and it "believes the proposed channelization scheme offers the potential for spectrum efficiency."²⁹ UTC also supports this plan as appropriate

since private microwave users are being asked to give up far more spectrum in the 2 GHz band than common carriers, and will therefore require access to a proportionately larger amount of replacement spectrum.³⁰

Similarly, Motorola praises the flexibility built into the plan:

Such a plan provides the flexibility to match the spectrum license to the user's individual needs. This approach in turn generally should allow more microwave users to occupy each band and provides for an efficient and effective frequency coordination process.³¹

C. ANS' Modified Plan Addresses Concerns Raised in Comments on the FNPRM.

In comments on the FNPRM, various parties raise specific concerns over the proposed reallocation and channelization plan.

²⁹API at 8, 10.

³⁰UTC at 3-4 (footnote omitted).

³¹Motorola at 4-5.

To solve these potential problems, certain parties submitted proposed revisions to the FNPRM.

Many of these proposed alternatives have merit and should be incorporated into the rules governing fixed microwave operation in the bands above 3 GHz. While commenters' criticism of the FNPRM is serious and made in good faith, certain alternative proposals should not be adopted because they would compromise spectral efficiency and because they would prejudice displaced low and medium capacity fixed microwave users.³² Following is a comparison of the rules proposed in the FNPRM with those in the Modified Plan and an explanation of why certain alternative proposals warrant Commission approval and why others do not.³³

1. 4 GHz band³⁴

FNPRM -- This band would be reallocated to private use on a co-primary basis with existing common carrier fixed and satellite

³²As mentioned, ANS reviewed the alternative proposals and determined that several of these approaches must be incorporated into the Modified Plan. Furthermore, in response to these comments, ANS has participated actively with TIA and other manufacturers to forge a consensus set of rules. It also has solicited input from satellite users in an effort to ensure that their concerns are satisfied. Indeed, ANS has made every effort to work with satellite users. On January 19, 1993, ANS telecopied its proposed revisions to the 4 GHz band reallocation for review by all the satellite interests participating in this proceeding.

³³See Attachment A, Appendix B for a detailed response by the ANS Technical Staff to specific issues raised in individual comments on the FNPRM.

³⁴This band (3.7-4.2 GHz) is allocated for common carrier fixed and fixed-satellite (space-to-earth or downlink) use. It is used primarily by high capacity common carrier fixed microwave systems and by licensed satellite and unlicensed receive-only TV earth stations.

services. It would be rechannelized from twelve (12) 20 MHz channel pairs to an overlapping:³⁵

- * 24-400 KHz pairs
- * 12-800 KHz pairs
- * 24-1.6 MHz pairs
- * 6-5.0 MHz pairs
- * 25-10 MHz pairs
- * 12-20 MHz pairs

Satellite carriers and other users of the 4 GHz band oppose the rechannelization proposal in the FNPRM. These parties claim that this proposal is unacceptable because it would cause harmful interference to current and prospective C-band video operations.³⁶

Specifically, the satellite industry opposes inclusion of 10 MHz channels in the proposed 4 GHz channelization plan because these channels would be offset by only 5 MHz from satellite transponder frequencies. Typically, terrestrial interference ("TI") filters are used to protect satellite transmission from fixed microwave users. In the configuration proposed in the FNPRM, TI filters apparently could not reduce terrestrial interference from point-to-point transmitters because such filters only are effective if the interfering transmitter is offset by 10 MHz from the satellite center frequency.³⁷ In addition, the satellite users

³⁵FNPRM, 7 FCC Rcd at 6102.

³⁶GE Americom at 6-7; Home Box Office ("HBO") at 2; Hughes Communications Galaxy, Inc. ("Hughes") at 3-7; SBCA at 2-3, 12-13; National Public Radio, Inc. ("NPR") at 4-5; GTE at 3-4.

³⁷See, e.g., GE Americom at 6-7; HBO at 9-12.

argue that the proposed placement of narrowband channels at the 4 GHz band edges present similar problems to TI filters.³⁸

Modified Plan -- To eliminate the problems identified by satellite users, ANS proposes revising the 4 GHz channel plan set forth in the FNPRM.³⁹ Due to existing usage, access to the 4 GHz band by displaced 2 GHz users will be restricted even under the best of circumstances. Nonetheless, the likely shortage of adequate replacement spectrum above 3 GHz necessitates pursuing all possibilities.

In the Modified Plan, the 10 MHz channels are centered at the same frequencies as the existing 20 MHz wideband channels. This change reduces the number of 10 MHz channels by half, but it still provides 12 channel pairs. Most importantly for the satellite users, their problem with terrestrial interference is rendered moot because this approach allows TI filters to be used. Furthermore, since 10 MHz radios have narrower bandwidths than wideband 20 MHz

³⁸In the TIA Plan, all 10 MHz and lower capacity 4 GHz band channels would be eliminated. TIA at 8; Joint Commenters at 8-9. This proposal misses the mark and should be rejected. Spectrum is needed for displaced low capacity 2 GHz users and the elimination of the such channels in the TIA Plan ignores these needs in favor of wideband needs by interexchange carriers. The Modified Plan, described below, achieves a more appropriate balance between narrowband and wideband channel requirements. Attachment A, Modified Plan at Section 3.1.4.

³⁹Id. at Sections 3.1.1 and 3.1.2.

systems, they will contribute less interference into satellite receivers.⁴⁰

A number of narrowband 5 MHz, 1.6 MHz, 800 KHz, and 400 KHz channels also are defined in the Modified Plan. These channels are all centered on the existing 20 MHz channels, allowing TI filters to be used in every case. Six of the 12 wideband 20 MHz channels are reserved for high capacity traffic (20 and 10 MHz bandwidths). Four of the wideband channels are shared by high capacity and medium capacity traffic (5 MHz and 1.6 MHz bandwidths). The remaining two wideband channels are designated for low capacity traffic (1.6 MHz, 800 KHz, and 400 KHz bandwidths).⁴¹

⁴⁰Id. at Section 3.1.1. In its comments, Northern Telecom proposes a new 40 MHz channel plan for the 4 GHz band. Northern Telecom at 5. This proposal is driven by Northern Telecom's desire to develop a United States market for a radio product it recently introduced in Canada. Technical problems, however, plague Northern Telecom's proposal. The wide bandwidth Northern Telecom proposes makes it impossible for satellite users to use TI filters for reducing terrestrial interference on the 4 GHz band. Consequently, Northern Telecom's 40 MHz plan would have the same effect as the 10 MHz plan originally proposed by ANS but eliminated in the Modified Plan. See Attachment A, Modified Plan at Section 3.1.3.

⁴¹Id. at Section 3.1.1. Several parties question ANS' proposed pairing of 4 GHz channels because, in certain situations, two "A" or two "B" channels would be paired. AT&T, Appendix A at 1; Comsearch at 4-6; National Spectrum Managers Association ("NSMA") at 2-3. ANS agrees. To be compatible with systems that will continue to operate under the existing plan, ANS proposes pairing "A" channels with "B" channels. Attachment A, Modified Plan at Section 3.1.2. However, in the interest of maximizing flexibility by frequency planners, such pairings merely are recommended, and non-standard pairings also should be permitted to facilitate clearing paths in congested areas. Id. Northern Telecom proposes retaining the old AT&T channel pairings, which would mix transmitters and receivers across the band. Northern Telecom at 10-11. This proposal is inappropriate because it requires that separate transmit and receive antennas be used on every path, which is inefficient and unnecessary. Attachment A, Modified Plan at

To put the satellite users' persistent opposition to reallocation of the 4 GHz band in context, it should not be forgotten that fixed microwave users were authorized to use this band first. Microwave systems began using the 4 GHz band in 1947. The first active satellite to receive and transmit simultaneously (at 4 and 6 GHz), AT&T's TELSTAR, was not launched until 1962. Other active satellite systems (operating on 4 GHz) rapidly proliferated thereafter.

Only after satellite users "invaded" the 4 GHz band was the need for interference standards established. The standards established by satellite users for terrestrial microwave systems were quite restrictive. This situation was further complicated in the mid-1970's when home owner TV receive-only stations became popular and further restricted implementation of new 4 GHz terrestrial microwave systems. Nevertheless, fixed microwave users have accepted such cohabitation and have expended substantial resources to ensure that their systems are coordinated with the satellite users.

Now the roles are reversed. Yet, satellite users still are unwilling to reciprocate and compromise. When the satellite-terrestrial microwave coordination standards were introduced to increase protection of satellite users, the noose was tightened on the fixed microwave licensees and their ability to operate on the 4 GHz band. Should the 4 GHz users successfully convince the

Section 3.1.2.

Commission that reallocation of the 4 GHz band is unacceptable, the noose will become even tighter.

Given the fact that ANS' Modified Plan eliminates all bases for the 4 GHz users' opposition, the Commission must cut through the rhetoric, impose a fair compromise, and adopt the 4 GHz reallocation proposed in the Modified Plan. Any further objections by this user group are purely protectionist, have no merit, and must not be countenanced in a proceeding where thousands of microwave users are being forced to move.

2. Common carrier 6 GHz band⁴²

FNPRM -- This band would be reallocated to private use on a co-primary basis with existing common carrier fixed and satellite communications services. It would be rechannelized from a 29.65 MHz-based plan to an overlapping 30 MHz-based plan:⁴³

- * 24-400 KHz pairs
- * 12-800 KHz pairs
- * 42-1.6 MHz pairs
- * 12-5.0 MHz pairs
- * 24-10 MHz pairs
- * 8-30 MHz pairs

ANS proposed changing the channel plan from 29.65 MHz to 30 MHz because most existing radios have been type-accepted for a full 30 MHz bandwidth; because a 30 MHz bandwidth would allow common modulator designs to be used in the 6 and 11 GHz bands and would

⁴²The 5.926-6.425 GHz common carrier band is allocated for fixed microwave and fixed-satellite (earth-to-space or uplink) use. It is used primarily by specialized common carriers, local exchange carriers, and cellular telephone companies.

⁴³FNPRM, 7 FCC Rcd at 6102.

allow common spectrum efficiency requirements to be specified for all bands from 4-11 GHz, resulting in manufacturing efficiencies; and because most new radios will be digital.

ANS' plan did not generate much support.⁴⁴ There is a strong consensus to maintain the 29.65 MHz channel spacing based upon AT&T's standard T-plan.⁴⁵ Moreover, if the 30 MHz plan proposed by ANS were adopted, there likely would be a large number of waiver requests to use the 29.65 plan for, inter alia, over-building existing systems, coordinating spur paths at junction stations, and adding analog video systems.

After considering these comments, ANS concludes that its 30 MHz plan is inappropriate at this time and that the 29.65 MHz channel spacings should be maintained. In addition, ANS proposes that the 30 MHz maximum allowable bandwidth, and integer submultiples, be preserved as it has been for the past forty (40) years. This scheme will cause the least impact to existing systems and will provide most of the advantages that would have resulted upon adoption of the 30 MHz channel plan.⁴⁶

⁴⁴Opposition to this plan was not uniform. Motorola and UTC support its adoption. Motorola at 4-5; UTC at note 6.

⁴⁵See AT&T, Appendix B at 1; Northern Telecom at 6; GTE at 5-6; MRC Telecommunications, Inc. ("MRC") at 3-4; Comsearch at 10; NSMA at 2-3; EMI Communications Corporation ("EMI") at 4; Bell Atlantic at 3-4.

⁴⁶See Attachment A, Modified Plan at Section 3.2.1. Pursuant to the TIA Plan, a temporary 15 MHz channel plan would be put into effect for a 5-year transition period so that existing 1 DS3 radios could be used. Joint Commenters at 7-8. This channel plan is unnecessary because most manufacturers currently offer radios that can be used under the rechannelization proposed in the Modified

ANS urges adoption of this approach to channelizing the lower 6 GHz band. It meets user needs for spectral efficiency and for maximizing marketplace competition. It reflects a clear industry consensus. It maintains the status quo and thus avoids undue and unnecessary disruption to existing services.

3. Ensuring adequate bandwidth for low and medium capacity displaced 2 GHz fixed microwave users

An essential ingredient in the Commission's proposed channel plan for the higher bands must be creating sufficient low and medium capacity channels to satisfy the needs of displaced 2 GHz fixed microwave users. The 2 GHz bands are populated mostly by such low and medium capacity systems. However, the candidate replacement bands above 3 GHz primarily are channelized for high capacity systems.

Under the FNPRM, the 4, 6, 10, and 11 GHz bands all are channelized so that, for the first time, specific bands are available for low, medium, or high capacity systems. This plan uses narrowband channels based upon a 1.6 MHz bandwidth.⁴⁷

In the plan proposed in the FNPRM, all low capacity channels are placed in reserved spectrum. For example, in the 6 GHz common carrier band, low capacity channels would be placed at the band

Plan. Attachment A, Modified Plan at Section 3.2.2.

⁴⁷Medium capacity channels have a 1.6 to 5 MHz bandwidth and a typical channel capacity of 4 to 12 DS1; low capacity channels have a 400/800 KHz bandwidth and a typical channel capacity of 1 to 2 DS1. See Attachment A, Modified Plan at Sections 4 and 5. See also Petition, Attachment 1 at Table 4.

edges and in the center gap so that medium and high capacity channels would not be blocked.⁴⁸ Similarly, for the upper 6 GHz band, the existing band edge channels are retained for low capacity systems. This architecture ensures that channels of varying bandwidths, serving systems with different capacity requirements, can co-exist in the same band.

In the TIA Plan, for medium and low capacity traffic, 3.75, 2.5 and 1.25 MHz bandwidths are proposed instead of 1.6 MHz, 800 and 400 KHz bandwidths. This channelization approach in the TIA Plan is proposed for the 4, 6, 10, and 11 GHz bands.⁴⁹

Unlike other alternative proposals submitted in this proceeding and incorporated into the Modified Plan, the 2.5 MHz-based channelization scheme in the TIA Plan is not in the public interest. Several parties support adoption of the 1.6 MHz plan in the FNPRM because it is more spectrally efficient and because users have more flexibility to upgrade their systems.⁵⁰ By contrast, under the TIA Plan, there would be significant fragmentation,

⁴⁸In its channel plan, AT&T proposes reserving substantial spectrum from the band edges and guard bands for PCS. AT&T, Appendix B at 3. This plan is unacceptable because it precludes allocation of adequate spectrum for displaced low or medium capacity 2 GHz microwave users. Attachment A, Modified Plan at Section 10.5.

⁴⁹TIA at 5; Joint Commenters at 5.

⁵⁰See AT&T, Appendix A at 2, Appendix B at 2, Appendix C at 2, and Appendix D at 2; USTA at 1-2. Systems could be upgraded from a 4 DS1 in the 1.6 MHz band to an 8 or 12 DS1 system in the 5 MHz band without a frequency or polarization change. It also would be possible to use a 3.2 MHz concatenated channel plan for systems with no requirement for future growth. Attachment A, Modified Plan at Section 4.1.

blockage of various channels, and polarization conflicts when a mixture of different channel bandwidths is required.⁵¹

The 1.6 MHz bandwidth has been used in various microwave bands for many years. Several major radio manufacturers currently offer equipment using 1.6 MHz bandwidths. Manufacturers without 1.6 MHz products should be able to adapt existing modulation processes for these bandwidths without undue hardship if a reasonable transition period is provided.⁵²

4. 6 GHz private op-fixed band⁵³

FNPRM -- This band would be reallocated to common carrier fixed use on a co-primary basis with existing private op-fixed service. It would be rechannelized from an overlapping five 800

⁵¹Id.

⁵²Id. at Section 4.2. ANS' motives in spearheading the process to establish a channel plan and operating rules for displaced 2 GHz users have been impugned by several competitors. Specifically, the Joint Commenters, while incorrectly describing ANS as a foreign company, allege that, since "the vast majority of U.S. microwave manufacturers do not produce equipment compatible with the 1.6 MHz-based channels, the proposed rechannelization plans have the effect, albeit unintended, of giving a competitive advantage to one manufacturer." Joint Commenters at 5. Nothing could be further from the truth. In Attachment A, Modified Plan at Figure 22, ANS documents that the Joint Commenters and other manufacturers all produce equipment capable of operating on a 1.6 MHz bandwidth. Furthermore, the selection of these narrow channel bandwidths is derived from requirements for digital modulation techniques set forth in Section 21.122 of the Commission's Rules. Thus, the Joint Commenters gratuitous statement at 5, that adoption of a 2.5 MHz plan would "remedy this competitive imbalance," does not deserve further consideration.

⁵³The 6.525-6.875 GHz private op-fixed band is allocated for fixed and fixed-satellite (earth-to-space) use. It is primarily used by private companies and by state and local governments.

KHz pairs, three 1.6 MHz pairs, fifteen 5 MHz pairs and sixteen 10 MHz pairs to an overlapping:

- * 12-400 KHz pairs
- * 6-800 KHz pairs
- * 45-1.6 MHz pairs
- * 15-5.0 MHz pairs
- * 16-10 MHz pairs

ANS proposed this reallocation to produce more spectrum for relocating 2 GHz common carrier users.⁵⁴ In addition, the proposed plan is similar to the current upper 6 GHz band channelization plan and to the proposed reallocation of the common carrier 4 and 6 GHz bands. Radio manufacturers can design common modulators for all bands. Upgrades from 4 to 12 DS1's could be implemented uniformly in all bands.⁵⁵

Certain parties, however, prefer reserving the upper 6 GHz private op-fixed band only for narrowband channels.⁵⁶ Under this proposed scenario, the lower 6 GHz common carrier band would remain the refuge of wideband users. Adoption of this plan would be contrary to the flexibility inherent in ANS' plan because displaced users would not be able to choose where to relocate.

Modified Plan -- In the TIA Plan, new 5 MHz channels have been defined which are co-channel with existing 10 MHz channels.

⁵⁴Petition, Attachment 1, at Section 3.1.

⁵⁵Id. at Section 3.5.

⁵⁶TIA, Appendix A; GTE at 6; Northern Telecom at 12.

ANS supports this proposal and incorporates it into the Modified Plan.⁵⁷

5. 10 GHz band⁵⁸

FNPRM -- This band would be reallocated from private and common carrier point-to-multipoint digital termination service and DEMS use to private and common carrier point-to-point fixed use on a co-primary basis.⁵⁹ It would be rechannelized into an overlapping twenty-four 400 KHz pairs, twelve 800 KHz pairs, thirty 1.6 MHz pairs, twenty 2.5 MHz pairs and eight 5 MHz pairs.⁶⁰

⁵⁷With the exception of the unwarranted elimination of existing low capacity 1.6 MHz and 800 KHz band edge channels, the only difference between the Modified Plan and the TIA Plan is that two segments of spectrum co-channel with the 10 MHz emergency restoration channels are not included. Attachment A, Modified Plan at Section 3.3 and Figure 9. In addition, there appear to be certain errors and omissions in the TIA Plan. For example, four 1.25 MHz channels from 6530 to 6535 MHz are listed which are co-channel with emergency restoration channels. These appear to be shifted by 5 MHz. There also are several 5 MHz channels that were not subdivided into lower capacity channels (1, 28, 1', 28') in Figure 8 of the TIA Plan. Attachment A, Modified Plan at Section 3.3.

⁵⁸The 10.550-10.680 GHz common carrier band is allocated for digital electronic message service ("DEMS") point-to-multipoint use and for point-to-point microwave use. Although several licenses were granted when DEMS was established, few systems have been installed. Thus, the point-to-multipoint segment of the 10 GHz band is relatively vacant.

⁵⁹ANS considers it inappropriate to eliminate the existing channelization and thus adversely affect manufacturers of this product. Consequently, ANS also proposes that the 2.5 MHz plan for the 10 GHz band be retained and that an alternate 1.6 MHz plan be adopted. Attachment A, Modified Plan at Section 3.4.2.

⁶⁰FNPRM, 7 FCC Rcd at 6102. The 10 GHz band is useful for short paths in urban areas where frequency congestion is a problem (i.e., less than 10 miles). Since it is affected by rain outage, the 10 GHz band is not used on long paths and paths requiring high reliability. In these applications, the lower frequency bands are preferred, and therefore the path length requirements for this band

Under the FNPRM, the current point-to-point channels would remain unchanged. However, given the scant number of DEMS operating systems, the point-to-multipoint section of the band would be rechannelized.

Few parties address the proposed 10 GHz band reallocation. API supports the proposed reallocation.⁶¹ SR Telecom, Inc. ("SR Telecom"), a 10 GHz equipment manufacturer, opposes the proposed reallocation, claiming that it is premature and that it would foreclose use of the company's point-to-multipoint equipment.⁶² If the reallocation is adopted, SR Telecom proposes that point-to-point and point-to-multipoint systems should share the spectrum on a co-primary basis.

SR Telecom's arguments are unavailing. First, the proposed reallocation is not premature because the limited amount of spectrum above 3 GHz being reallocated to displaced users almost certainly will require access to the 10 GHz band. Second, ANS strongly opposes co-primary sharing of the 10 GHz band. Such sharing by point-to-point and point-to-multipoint systems presents extremely difficult frequency coordination problems resulting in an inferior solution for both services.⁶³

remain unchanged. Petition, Attachment 1 at Section 3.7.

⁶¹API at 11-12.

⁶²SR Telecom at 2. SR Telecom argues that it is premature to implement the reallocation and that the FCC should wait to determine if there is sufficient demand by relocated 2 GHz users for the 10 GHz band. Id. at 8-9.

⁶³Attachment A, Modified Plan at Section 3.4.1.

Modified Plan -- In the TIA Plan, allocation of three additional 5 MHz channels in the existing point-to-point section of the 10.555-10.565 GHz and 10.615-10.630 GHz bands is proposed. ANS supports this recommendation and includes it in the Modified Plan.⁶⁴

6. 11 GHz band⁶⁵

FNPRM -- This band would be reallocated to private microwave use on a co-primary basis with existing common carrier fixed service. In addition, this band would be rechannelized from twelve 40 MHz pairs to an overlapping fifty 10 MHz pairs and sixteen 30 MHz pairs.⁶⁶

The traditional use of 40 MHz channels in the 11 GHz common carrier band would be replaced by 10 MHz low capacity and 30 MHz high capacity channel bandwidths. With the new channelization, sixteen (16) rather than twelve (12) duplex channels thus would be available, which would achieve a much needed improvement in spectrum efficiency.⁶⁷ Moreover, the addition of four wideband 30

⁶⁴Id. at Section 3.4.2 and Figure 12.

⁶⁵The 11 GHz band is allocated for common carrier use. It primarily is used by specialized common carriers, local exchange carriers, and cellular telephone companies.

⁶⁶FNPRM, 7 FCC Rcd at 6102. This plan is compatible with the existing DE and PJ frequency plans for the 11 GHz band. Attachment A, Modified Plan at Section 3.5.1.

⁶⁷Petition, Attachment 1 at Section 3.8.

MHz channel pairs in the 11 GHz band would offset the loss of two 30 MHz channel pairs in the 6 GHz common carrier band.⁶⁸

API and USTA support the proposed rechannelization because it promotes spectrum efficiency.⁶⁹ However, several parties oppose this rechannelization proposal. These parties argue that the proposed channelization would result in undue interference between users utilizing different bandwidths.⁷⁰

In addition, an alternate approach to channelizing the 11 GHz band is presented in the TIA Plan. Under the TIA Plan, 40 MHz and 30 MHz channels would be allocated. However, the TIA Plan is based upon 2.5 MHz channels and thus does not adequately accommodate the needs of interexchange and other carriers for wideband channels.⁷¹

Modified Plan -- ANS' proposed 30 MHz plan is the most efficient use of the spectrum. However, it is likely that there will be many waiver requests to use the existing 40 MHz plan for overbuilding existing systems and for other special circumstances.⁷²

In view of the stated industry need to retain a 40 MHz plan, ANS has revised its proposal. This revision ensures compatible

⁶⁸Attachment A, Modified Plan at Section 3.5.1.

⁶⁹API at 12; USTA at 4 (acknowledging that some systems may have to be grandfathered).

⁷⁰MRC at 4-5; Pacific Telesis at 3-4; AT&T at Appendix C.

⁷¹Attachment A, Modified Plan at Section 3.5.2.

⁷²The proposed 30 MHz plan also would not accommodate an 11 GHz version of the Northern Telecom 6 DS3 40 MHz radio. In addition, rain outage would limit the utility of such a radio severely.

frequency pairings with existing DE and PJ plans and provides flexibility should a 40 MHz plan be retained.

If the Commission decides to retain a 40 MHz channel plan, ANS proposes certain revisions to the FNPRM which generally follow the TIA Plan.⁷³ Under this proposed revision, in a geographical area using the PJ plan, the 30 MHz channel plan is used, and in an area using the DE plan, the 40 MHz channel plan is used.

Moreover, two (2) additional 30 MHz channels are added in the 60 MHz center gap of the band. This change would allow the number of 30 MHz channel pairs to increase from 12 to 13 under the PJ plan.⁷⁴

7. Concatenated channels

FNPRM -- In the FNPRM, the Commission follows ANS' proposal for the use of concatenated frequency plans in which two (2) or more adjacent channels are combined into a wider channel.⁷⁵ This approach promotes flexibility in defining new channelization plans without requiring a lengthy petition process through the Commission.⁷⁶

Under this proposal, 400 KHz, 1.6 MHz and 10 MHz channels would become basic building blocks for low, medium and high capacity systems respectively. These "building blocks" could be

⁷³Attachment A, Modified Plan at Section 3.5.3.

⁷⁴Id.

⁷⁵FNPRM, 7 FCC Rcd at 6114.

⁷⁶Attachment A, Modified Plan at Section 6.

used to construct wider channels to solve particular spectrum management problems in the industry or to accommodate future advances in radio technology.

The Joint Commenters object to this plan. They claim that concatenated channels would decrease spectrum utilization by creating "splinter" channels.⁷⁷

ANS disagrees. Unrestricted creation of concatenated frequencies would promote efficient spectrum usage. Accordingly, ANS urges adoption of its proposed approach to establishing concatenated frequency plans.⁷⁸

8. Spectrum efficiency requirements

In the TIA Plan, spectrum efficiency requirements are proposed to accommodate 2.5 MHz-based channel plans.⁷⁹ Given the problems inherent in this plan that are detailed herein, ANS opposes its adoption.

The channel plan changes proposed in the Modified Plan necessitate revisions to the corresponding spectrum efficiency requirements proposed in the FNPRM.⁸⁰ Such efficiency criteria must be adopted to guarantee ideal spectrum use. ANS' spectrum efficiency requirements are preferable to the less stringent TIA

⁷⁷Joint Commenters at 10-11.

⁷⁸Attachment A, Modified Plan at Section 6. ANS proposes revising Section 21.122(a)(2) of the Commission's Rules to reflect this approach. Id.

⁷⁹Joint Commenters at 17-20; TIA at 10-12. See also EMI at 2.

⁸⁰Attachment A, Modified Plan at Section 7.

Plan because: (i) it is compatible with state-of-the-art equipment; (ii) it does not favor any manufacturer; and (iii) for any given bandwidth, it allows more data to be transmitted.

ANS agrees with the proposal in the TIA Plan for a transition period before any new spectrum efficiency requirements become effective. Such a transition plan is necessary to allow microwave users to continue purchasing existing radios while newer, more efficient product is being developed.⁸¹ However, ANS disagrees with the TIA Plan that a 5-year transition is necessary and instead recommends the traditional 2-year transition.⁸² This shorter transition will spur expedited product development and is adequate for manufacturers to design and produce such new product.⁸³

**VI. REALLOCATION OF THE 3.6-3.7 GHZ BAND MUST
BE PURSUED ACTIVELY BY THE COMMISSION**

The 3.6-3.7 GHz band is allocated on a shared basis for government and non-government use.⁸⁴ Given the problems in coordinating between fixed microwave users and satellite users in the 4 GHz band and given the projections for fixed microwave use in the 6, 10 and 11 GHz bands, ANS is pessimistic that adequate spectrum will be available. To prevent any spectrum shortage from

⁸¹Attachment A, Modified Plan at Section 14.

⁸²Id.

⁸³Id.

⁸⁴47 C.F.R. Section 2.106 (1992). For government use, this band is allocated for aeronautical radionavigation and radiolocation on a primary basis. For non-government use, this band is allocated for fixed satellite downlink service on a primary basis and radio location service on a secondary basis. Id.

occurring, ANS, in its Petition, proposed that the non-government 3.6-3.7 GHz band be reallocated to fixed point-to-point use for common carrier and private op-fixed users on a co-primary basis.⁸⁵

Pursuing reallocation of the 3.6-3.7 band is timely because the National Telecommunications and Information Administration ("NTIA") is beginning to open up its allocation process. To fulfill its longstanding policy objectives and to meet its new congressional mandate, the NTIA is attempting to identify long-term spectrum needs of all U.S. users and how it can address those needs.⁸⁶

Issues involving reallocation of the 3.6-3.7 GHz band will take several years to resolve, which is consistent with the NTIA's anticipated time frame for determining its spectrum needs, as well as with the time frame when the 3.6-3.7 GHz non-government band would be needed for private sector fixed microwave use. According-

⁸⁵Relocation of 2 GHz fixed microwave users to the 3.6-3.7 GHz band clearly is justified. The channelization plan for the 3.6-3.7 GHz band provides RF bandwidths from 400 KHz to 10 MHz, which accommodates the needs of low, medium and high capacity users. Reallocation of the 3.6-3.7 GHz band would avoid satellite coordination requirements that limit use of the 4 GHz band. Moreover, this band has propagation characteristics comparable to the 2 GHz band. Congestion in the non-government 3.6-3.7 GHz band is not a problem. It is used by INTELSAT, which has a nominal number of earth stations deployed in the United States.

⁸⁶See National Telecommunications and Information Administration, Current and Future Requirements for the Use of Radio Frequencies in the United States, Notice of Inquiry; Request for Comments, 57 Fed. Reg. 25010 (June 12, 1992) (solicitation of data to facilitate opening up government spectrum to the private sector); Telecommunications Authorization Act of 1992, Pub. L. No. 102-538 (1992) (requires NTIA to make government spectrum more accessible to the public).

ly, in its Petition, ANS stated that "it is appropriate now to initiate public consideration of reallocating the non-government 3.6-3.7 GHz band to fixed use as one option for the displaced 2 GHz users."⁸⁷

Inexplicably, the Commission disagrees. In the FNPRM, it states:

We do not believe that the 3.6-3.7 GHz band can accommodate additional non-government users at this time. While the band is allocated to the non-government FSS, such use is limited due to frequency coordination and electromagnetic compatibility constraints with government users. The predominant use is for government aeronautical radio navigation and military radiolocation services. Permitting fixed microwave use of this band would create the potential for interference to these important services. Accordingly, we are not proposing to allocate this band for fixed microwave use.⁸⁸

An olive branch, however, has been extended by the Commission. It promises to approach NTIA and to open formal discussions for determining whether some form of shared access to this band by fixed microwave users would be feasible.⁸⁹ The Commission's lukewarm approach to coordinating with NTIA regarding the 3.6-3.7 band is unacceptable. This spectrum is appropriate for displaced 2 GHz users and is needed to ensure their future operation.⁹⁰

⁸⁷Petition at 22.

⁸⁸FNPRM, 7 FCC Rcd at 6103.

⁸⁹Id.

⁹⁰See note 85, supra.

Despite the Commission's decision in the FNPRM to take the path of least resistance and merely open discussions with NTIA, several parties continue supporting reallocation of the 3.6-3.7 GHz band. TIA states that the spectrum above 3 GHz for dislocated fixed microwave users will be inadequate to meet current and/or future spectrum needs, and therefore it urges the Commission to "aggressively pursue non-government access to...the 3.6-3.7 GHz band."⁹¹ Moreover,

TIA firmly believes that with proper coordination government and non-government users can happily co-exist in the...3.6-3.7 GHz band . . . Accordingly, TIA urges the Commission to accelerate its negotiations within NTIA to facilitate non-government access to the 3.6-3.7...band concurrent with the close of this proceeding.⁹²

Similarly, UTC and API strongly support reallocation of this band. UTC states that the 3.6-3.7 GHz band "has propagation characteristics suitable for long-haul communications and would thus be capable of supporting the long microwave paths being displaced from the 2 GHz band."⁹³ In its comments, API concludes that the 3.6-3.7 GHz band is an "excellent accommodation for...longer distance requirements" and therefore emphasizes that this band "must be included in the Commission's overall effort to provide

⁹¹TIA at 14.

⁹²Id. at 14-15.

⁹³UTC at 7.

meaningful relief for licensees who would otherwise continue [to] use the 2 GHz band."⁹⁴

Expected spectrum shortage cannot be ignored.⁹⁵ Reallocation of the 2 GHz band by the Commission has created this problem, and the Commission therefore must pursue all measures available to remedy the shortage. On the basis of strong support in the record of this proceeding, the Commission is obligated to escalate its efforts and to institute formal proceedings to reallocate the 3.6-3.7 GHz band.⁹⁶

This reallocation certainly would be beneficial. ANS anticipates that microwave equipment manufacturers would be willing to design 4 GHz band radios to be usable in the adjacent 3.6-3.7 GHz band. Once this band becomes available, rapid deployment of product would soon follow. Due to the known satellite coordination problems in the 4 GHz band, narrowband users would move quickly to the adjacent 3.6-3.7 GHz band if it were made available.⁹⁷

⁹⁴API at 13-14. See also Northern Telecom at 6; Joint Commenters at 23-24.

⁹⁵See note 13 above.

⁹⁶This reallocation may involve a long-term program of retiring existing radionavigation equipment in the band or relocating it to the adjacent 3.5-3.6 GHz band. Attachment A, Modified Plan at Section 3.1.1.

⁹⁷This scenario should benefit 4 GHz band satellite licensees and should motivate them to join ANS in promoting reallocation of the 3.6-3.7 GHz band.

**VII. THE COMMISSION MUST ADOPT TECHNICAL
RULES THAT PERMIT A SEAMLESS TRANSITION
FOR DISPLACED 2 GHz FIXED USERS**

- A. The Record Generally Supports Adoption of the Technical Rules Proposed in the FNPRM.

In its Petition, ANS developed a specific set of technical rules to govern operation by fixed microwave users in the bands above 3 GHz. These proposed rules would prescribe minimum path length, channel loading, and capacity for bandwidth; frequency and interference coordination criteria; and antenna standards.⁹⁸

The Commission, in the FNPRM, proposes adopting most of ANS' suggested technical rules. However, based upon comments filed in response to the Petition, the Commission proposes modest changes to the rules involving coordination, loading standards, and use of ATPC.

In general, adoption of the technical rules proposed in the FNPRM is supported by the record of this proceeding. Any differences among the parties primarily involve issues affecting users, such as frequency and interference coordination. Resolution of these differences should be based only upon input from the users directly affected. As a manufacturer, ANS can accommodate all user needs regardless of what the Commission decides.

⁹⁸See Petition at 4.

B. The Commission Needs to Resolve Certain Differences Regarding Various Technical Issues.

1. Frequency coordination

The Commission, in the FNPRM, proposes that, instead of applying Part 21 coordination procedures across-the-board, it "would be least disruptive to existing users to maintain current procedures in each band...."⁹⁹ Thus, Part 21 interference standards would be applied in all replacement bands except the 6 GHz private band, where Part 94 standards would apply.¹⁰⁰

Most parties commenting on this proposal disagree and recommend application of Part 21 frequency coordination procedures for all bands. For example, Comsearch claims that implementation of the prior coordination notice procedures under Part 21 for all the replacement bands is essential to the success of any sharing.¹⁰¹

ANS agrees with the Commission's approach. Any user coordinating a path in a Part 94 band should use Part 94 technical requirements, including accepted interference standards (e.g. Bulletin 10). Similarly, users in a Part 21 band should use Part 21 interference standards.¹⁰²

⁹⁹FNPRM, 7 FCC Rcd at 6105.

¹⁰⁰Id.

¹⁰¹Comsearch at 12-13. See also TIA at 13; NSMA at 6; GTE at 7; UTC at 9-10; USTA at 7; Joint Commenters at 14.

¹⁰²Attachment A, Modified Plan at Section 12.