MEETING DATE: 2/11/08

AGENDA ITEM: **Approval to purchase Voice Over IP technology from Arreva Communications**

ATTACHMENTS

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Redesignation of the 17.7-19.7 GHz Frequency	)	
Band, Blanket Licensing of Satellite	)	IB Docket No. 98-172
Earth Stations in the 17.7-20.2 GHz and	)	RM-9005
27.5-30.0 GHz Frequency Bands,	)	RM-9118
and the Allocation of Additional Spectrum	)	
in the 17.3-17.8 GHz and 24.75-25.25 GHz	)	
Frequency Bands for Broadcast	)	
Satellite-Service Use	)	

NOTICE OF PROPOSED RULEMAKING

Adopted: September 17, 1998 **Released:** September 18, 1998

Comment Date: November 5, 1998
Reply Comment Date: December 7, 1998

By the Commission:

TABLE OF CONTENTS

I. INTRODUCTION

1. In this proceeding, we propose to redesignate the 17.7-19.7 GHz band among the various allocated services in order to make more efficient and better use of this portion of the spectrum. Pursuant to the Commission's *28 GHz First Report and Order*,[1] much of this spectrum is currently allocated for shared use between terrestrial fixed service and Ka-band Fixed Satellite Service ("FSS").[2] With non-government FSS licensees planning to deploy potentially millions of small antenna earth stations, we are concerned, however, about the feasibility of sharing between terrestrial fixed service and ubiquitously deployed FSS earth stations. In this Notice of Proposed Rulemaking ("NPRM"), we address several possible means for existing and future licensees to share this band. We have tentatively concluded, in light of the current state of technological development, that the public interest is best served by separating terrestrial fixed service operations from the operations of non-government ubiquitously deployed FSS earth stations into dedicated sub-bands.[3]

2. Specifically, we propose to provide primary designations[4] for: (1) terrestrial fixed services use in the 17.7-18.3 GHz band; (2) Geostationary Orbit Fixed Satellite Service ("GSO/FSS") use in the 18.3-18.55 GHz band; and, (3) Non-Geostationary Orbit Fixed Satellite Service ("NGSO/FSS") use in the 18.8-19.3 GHz band.[5] We propose to retain the co-primary designations for: (1) terrestrial fixed service use and GSO/FSS use in the 18.55-18.8 GHz band; and, (2) terrestrial fixed service use and Mobile Satellite Service Feeder Link ("MSS/FL") use in the 19.3-19.7 GHz band. In bands where the terrestrial fixed service

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[1] *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *First Report and Order and Fourth Notice of Proposed Rulemaking*, CC Docket No. 92-297, 11 FCC Rcd 19005 (1996) (*28 GHz First Report and Order*).

[2] The term "Ka-band" refers to the space-to-Earth (downlink) frequencies at 17.7-20.2 GHz and the corresponding Earth-to-space (uplink) frequencies at 27.5-30.0 GHz. The downlink portion of the band is referred to as the 18 GHz band, and the uplink portion of the Ka-band is referred to as the 28 GHz band.

[3] The United States Government is authorized to use the Ka-band for military satellite systems. This NPRM does not propose to change the relationship between Government and non-Government operations. *See* Amendment of Part 2 of the Commission's Rules to Allocate Spectrum for the Fixed-Satellite Service in the 17.8-20.2 GHz Band for Government Use, *Memorandum Opinion and Order,* 10 FCC Rcd 19 (1995).

[4] A service designated as primary is the only service given priority status to operate in a frequency band. A service designated as co-primary must share operations with other services designated as co-primary in the frequency band on a co-equal basis. A service designated as secondary is allowed to use the band as long as its operations do not cause interference to any primary designated operations. If a secondary service operation causes interference to a primary service, the secondary service provider must cease operation. *See generally* 47 C.F.R. § 2.105(c).

[5] Although we propose changes to only the 17.7-19.3 GHz portion of the band, the 19.3-19.7 GHz portion of the band is affected by the proposal because there is an existing terrestrial fixed service channeling plan that spans the entire 17.7-19.7 GHz band. Because the terrestrial fixed service channeling plan includes paired channels for two-way communications, any changes in the 17.7-19.3 GHz frequency segment will affect the terrestrial fixed service channeling plan in the 19.3-19.7 GHz frequency segment.

would lose its current co-primary status (18.3-18.55 GHz and 18.8-19.3 GHz), we propose to grandfather existing terrestrial fixed service operations. We request comment on this proposed band plan, as well as on possible modifications to the proposal that would allow continued sharing in additional portions of the 17.7-19.7 GHz band. We also seek comment on whether there is any means by which terrestrial fixed service and FSS could feasibly continue to share the entire band.

3. In addition, we propose a blanket licensing procedure that would allow Ka-band FSS satellite earth stations to operate under a single system license in bands that are designated for their primary use.[6] Thus, we propose to allow blanket licensing of GSO/FSS satellite earth stations in the existing GSO/FSS bands, 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.5-30 GHz and, in conjunction with our proposed band, the 18.3-18.55 GHz band. In addition, we propose to allow blanket licensing of NGSO/FSS earth stations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands. We believe that blanket licensing will provide a fast and efficient means for licensing the large numbers of small antenna FSS earth stations expected to be deployed.

4. Finally, we propose to allocate additional spectrum for the Broadcast Satellite Service ("BSS") and we propose to conform this allocation to the International Telecommunication Union ("ITU")[7] Region 2 BSS allocation. Specifically, we propose to allocate the 17.3-17.8 GHz band to BSS;[8] to allocate the 24.75-25.25 GHz band to Fixed Satellite Service ("FSS") for BSS feeder link use;[9] and to implement these allocations effective April 1, 2007. These proposed allocations will provide additional spectrum for direct-to-home video services. This increased amount of spectrum should allow BSS operators to offer an increased variety of programming and services which would enhance competition in the multichannel video programming market. We address the BSS allocation in this proceeding because part of the spectrum allocated (17.7-17.8 GHz) is also involved in our band redesignation plan.

5. We note that United States Government systems are authorized to operate in the

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[6] GSO/FSS and NGSO/FSS operators propose to blanket license small antenna satellite earth stations that are transmit/receive end user terminals. Therefore, in our discussions of blanket licensing, we consider both the uplink and downlink portions of the Ka-band.

[7] The ITU, headquartered in Geneva, Switzerland, is an agency of the United Nations that deals with, and sets standards for, international communications issues.

[8] ITU Radio Regulations Footnote S5.517 states: "In Region 2, the allocation to the broadcasting-satellite service in the band 17.3-17.8 GHz shall come into effect on 1 April 2007. After that date, use of the fixed-satellite service (space-to-Earth) service in the band 17.7-17.8 GHz shall not claim protection from and shall not cause harmful interference to operating systems in the broadcasting-satellite service."

[9] ITU Radio Regulations Footnote S5.535 states: "In the band 24.75-25.25 GHz, feeder links to stations of the broadcasting-satellite service shall have priority over other uses in the fixed-satellite service (Earth-to-space). Such other uses shall protect and shall not claim protection from existing and future operating feeder-link networks to such broadcasting satellite stations."

17.8-20.2 GHz band in accordance with footnote US334 in the United States Table of Frequency Allocations.[10] This NPRM concerns only non-Government operations; coordination between Government and non-Government operations will continue to remain in effect.

II. BACKGROUND

6. Development of the current band plan for both the 18 GHz and 28 GHz bands began in 1992 when three petitions for rulemaking were filed proposing changes in the rules concerning terrestrial fixed services in the 28 GHz band.[11] In January 1993, the Commission released the *28 GHz First Notice of Proposed Rulemaking,* proposing to designate spectrum for Local Multipoint Distribution Service ("LMDS") use.[12] This NPRM proposed a solution that accommodated the needs described by petitioners and requested comments on what effects the proposal would have on the proposed satellite use of the band. In February 1994, the Commission tentatively concluded that it was in the public interest to allow terrestrial fixed and satellite providers to co-exist in the 28 GHz band and established the LMDS/FSS 28 GHz Band Plan Negotiated Rulemaking Committee ("NRMC").[13] In July 1995, the Commission released the *28 GHz Third Notice of Proposed Rulemaking* that proposed to allow LMDS, GSO/FSS, NGSO/FSS, and MSS/FL access to the 28 GHz band and requested comment on satellite uplink-downlink pairing.[14] Based on the work of the NRMC and additional comment from industry, the Commission issued the *28 GHz First Report and Order* adopting a band

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[10] *See* 47 C.F.R. § 2.106. Footnote US334 states: "In the band 17.80-20.20 GHz, Government space stations and associated earth stations in the fixed satellite (space-to-Earth) service may be authorized on a primary basis. For a Government geostationary satellite network to operate on a primary basis, the space station shall be located outside the arc measured from East to West, 70°W to 120°W. Coordination between Government fixed-satellite systems and non-Government systems operating in accordance with the United States Table of Frequency Allocations is required."

[11] Harris Corp-Farinon Division requested that the Commission channelize the 28 GHz band for point-to-point use, CellularVision requested that the rules be changed to allow point-to-multipoint services in the 28 GHz band, and Video/Phone Systems, Inc. proposed a broadband-on-demand video telecommunications service. *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 19.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Third Notice of Proposed Rulemaking and Supplemental Tentative Decision*, CC Docket 92-297, 11 FCC Rcd 53 (1995).

[12] *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *First Notice of Proposed Rulemaking*, CC Docket No. 92-297, 8 FCC Rcd 557 (1993).

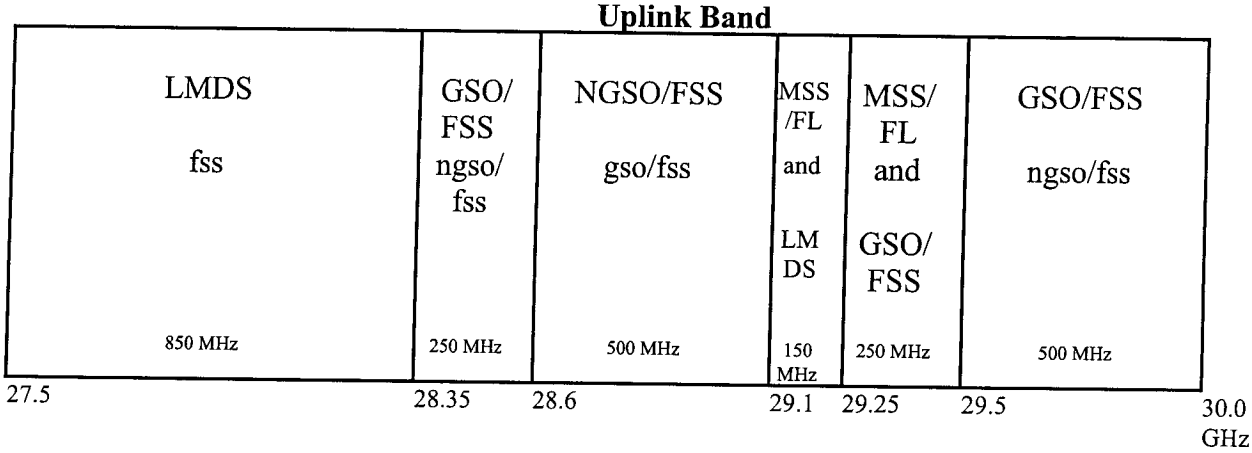
[13] *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Second Notice of Proposed Rulemaking*, CC Docket No. 92-297, 9 FCC Rcd 1394 (1994).

[14] *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Third Notice of Proposed Rulemaking*, CC Docket No. 92-297, 11 FCC Rcd 53 (1995).

plan in July 1996.[15] In issuing the *28 GHz First Report and Order*, the Commission intended to satisfy the requirements of numerous competing terrestrial fixed service and satellite interests. The NRMC focused on evaluating spectrum sharing between terrestrial fixed services and fixed satellite services in the satellite uplink band at 28 GHz. Accordingly, while the decision in the *28 GHz First Report and Order* cited the potential for some difficulties with sharing between terrestrial fixed and satellite services in the 18 GHz band, the record at that time did not warrant separation of these services in the downlink band as well. Rather, the Commission in the *28 GHz First Report and Order* stated that the 17.7-19.7 GHz band would be shared on a co-equal basis between terrestrial fixed and satellite services and that coordination would be required under procedures outlined in Sections 25.130 and 101.103 of our Rules.[16] The Commission, however, indicated that if the affected parties wished to propose slightly modified coordination procedures to facilitate the implementation of these services, we would consider such a proposal in the future.[17]

7. The band plan adopted in the *28 GHz First Report and Order* is as follows:[18]

Uplink Band

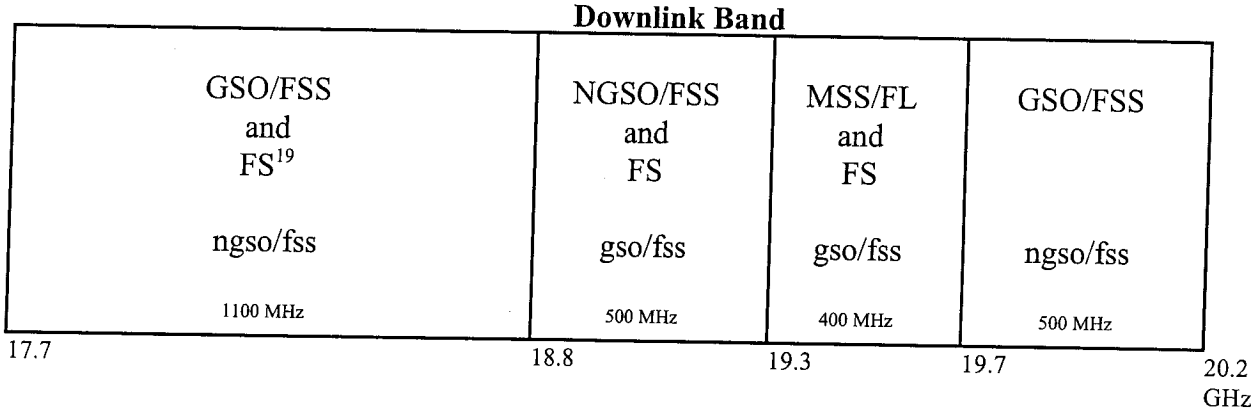


[15] *Supra* note 1.

[16] *See* 47 C.F.R. §§ 25.130, 101.103. The *28 GHz First Report and Order* also designated the 19.7-20.2 GHz band for primary use by GSO/FSS (the segment was allocated for FSS and MSS use).

[17] *28 GHz First Report and Order*, 11 FCC Rcd at 19038.

[18] *See* 11 FCC Rcd 19005. Services designated for primary domestic licensing priority are specified in capital letters and services designated for secondary domestic licensing priority are specified in lower case letters. *See supra* note 4. In addition, *see* 47 C.F.R. § 2.106 for the specific frequency allocations in the 17.7-20.2 GHz band.



As shown above, the current downlink band plan is as follows: the 17.7-18.8 GHz band is designated for co-primary use by terrestrial fixed service and GSO/FSS; the 18.8-19.3 GHz band is designated for co-primary use by terrestrial fixed service and NGSO/FSS; the 19.3-19.7 GHz band is designated for co-primary use by terrestrial fixed service and MSS/FL; and the 19.7-20.2 GHz band is designated for primary use by GSO/FSS.

8. Terrestrial fixed services currently operating in the 17.7-19.7 GHz band include Cable Television Relay Service ("CARS"), auxiliary broadcasting, local television transmission, fixed point-to-point, and low power point-to-multipoint.[20] These services meet a variety of important communications needs, including remote monitoring of gas and petroleum pipelines, public safety links, video distribution links, and point-to-point data links. There are tens of thousands of terrestrial fixed links currently licensed in the 17.7-19.7 GHz band. Terrestrial fixed service use of this band is expected to increase as a result of migration of users from the congested lower terrestrial fixed service bands to this band, and from the need for new systems to support the introduction of new services such as digital television broadcasting, Personal Communications Services, and other digital communications systems.

9. Satellite services licensed to operate in the Ka-band include GSO/FSS, NGSO/FSS, and MSS/FL.[21] The Commission has granted thirteen GSO/FSS licenses and one NGSO/FSS license. The currently-licensed GSO/FSS and NGSO/FSS systems in this band have the potential to provide global Internet access, two-way digital communications, videoconferencing, interactive multimedia, telemedicine and residential voice and data communications services. Within the next five to ten years, we anticipate that these services will be provided to millions of United States businesses and consumers using small antenna Ka-band satellite earth stations.

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[19] Terrestrial Fixed Service

[20] The spectrum used for Digital Electronic Message Service ("DEMS") was recently changed. *See* Amendment of the Commission's Rules to Relocate the Digital Electronic Message Service From the 18 GHz Band to the 24 GHz Band and to Allocate the 24 GHz Band For Fixed Service, *Order*, 12 FCC Rcd 4990 (1997), *aff'd*, *Memorandum Opinion and Order*, FCC 98-155, ___FCC Rcd ___ (rel. July 17, 1998).

[21] *Supra* note 3.

10. In addition to the existing licensees, on December 22, 1997, the Commission closed the filing window for second round Ka-band FSS systems. The Commission received applications for 17 additional FSS systems during the second round Ka-band filing window. These applications included proposals for GSO/FSS, NGSO/FSS, and hybrid GSO and NGSO satellite systems.[22] We note that some applicants requested use of spectrum that is inconsistent in several aspects with the current band plan. Any licenses granted to second round Ka-band applicants will be conditioned upon conformance with the final band plan adopted in this proceeding and any service rules that are adopted in the licensing proceeding.

11. On December 23, 1996, Lockheed Martin Corporation, AT&T Corp., Hughes Communications, Inc., Loral Space & Communications Ltd., and GE American Communications, Inc. ("Petitioners") filed a joint Petition for Rulemaking proposing blanket licensing for GSO/FSS earth stations operating in certain portions of the Ka-band. On January 16, 1997, the Commission placed the petition on Public Notice and assigned it rulemaking number RM-9005.[23] Teledesic Corporation, licensee of a NGSO/FSS system in the Ka-band, filed comments supporting the petition and proposed that the rulemaking proceeding be expanded to include blanket licensing for all types of satellite earth stations in the Ka-band, including NGSO/FSS earth stations. On September 5, 1997, the Commission issued a Public Notice requesting comments on issues raised by the petition and to refresh the record.[24] In response to this Public Notice, twenty-two formal comments were filed.[25]

12. In 1997, the Commission issued licenses to 13 GSO/FSS applicants[26] and one NGSO/FSS applicant[27] to launch and operate Ka-band FSS systems. On October 9, 1997, the

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[22] These second round applications will be addressed in a future licensing proceeding.

[23] *See Public Notice*, Report No. 2173 (rel. Jan. 16, 1997).

[24] *See "Commission Requests Comment to Refresh Record on Proposals for Blanket Licensing of Satellite Earth Stations Operating in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands and Sharing Between Fixed Terrestrial and Satellite Services in the 17.7-19.7 GHz Frequency Bands", Public Notice*, IN Report No. 97-27 (rel. Sept. 5, 1997).

[25] The commenters are listed in Appendix A.

[26] On May 9, 1997, the Commission assigned orbital locations to the thirteen GSO/FSS applicants. *See* Assignment of Orbital Locations to Space Stations in the Ka-band, *Order*, FCC Rcd 13737 (1997). On the same day, the Commission also granted licenses for the thirteen GSO/FSS applicants. *See* Authorizations of: Comm, Inc. (DA 97-968); GE American Communications, Inc. (DA 97-970); EchoStar Satellite Corporation (DA 97-969); Hughes Communications Galaxy, Inc. (DA 97-971); KaStar Satellite Communications Corp. (DA 97-972); Lockheed Martin Corporation (DA 97-973); Loral Space & Communications Ltd. (DA 97-974); Morning Star Satellite Company, L.L.C. (DA 97-975); NetSat 28 Company, L.L.C. (DA 97-976); Orion Atlantic, L.P. (DA 97-979); PanAmSat Licensee Corp. (DA 97-978); and VisionStar, Inc. (DA 97-980); Orion Network Systems, Inc. (DA 97-977) (International Bureau May 9, 1997).

[27] The Teledesic license was granted on March 14, 1997. *See* Application of Teledesic Corporation for Authority to Construct, Launch, and Operate a Low Earth Orbit Satellite System in the Domestic and International Fixed Satellite Service, *Order*, 12 FCC Rcd 3154 (1997).

Commission adopted licensing qualification requirements and service rules for Ka-band FSS systems.[28] These service rules impose a strict timetable for the implementation of Ka-band GSO and NGSO FSS systems.[29] Although these systems are not yet in operation, we expect the deployment of commercial Ka-band FSS systems in the near future.

13. On June 5, 1997, DIRECTV Enterprises, Inc., ("DIRECTV") filed a Petition for Rulemaking proposing to reallocate the 24.75-25.25 GHz band to FSS for BSS feeder link use and the 17.3-17.8 GHz band to BSS for its downlinks. In addition, DIRECTV requested that the Commission adopt a 4.5° orbital spacing policy in licensing BSS space stations to operate in the 17.3-17.8 GHz and 24.75-25.25 GHz bands. On July 1, 1997, the Commission placed this petition on public notice and assigned it rulemaking number RM-9118.[30] In response to DIRECTV's petition, seven comments and three reply comments were filed.[31] We address the DIRECTV petition in this rulemaking due to the potential impact of the proposed band plan on a BSS downlink allocation at 17.7-17.8 GHz.

III. DISCUSSION

A. The Joint FSS Petition

14. Petitioners propose blanket licensing for GSO/FSS earth stations operating in those portions of the Ka-band that are not currently shared with the terrestrial fixed service (*i.e.*, the 19.7-20.2 GHz, 28.35-28.6 GHz, and 29.25-30.0 GHz bands).[32] In support of the blanket licensing proposal, Petitioners state that there will be millions of GSO/FSS earth stations and that individual licensing of these earth stations would result in delay, increased

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[28] *See* Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 19.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *Third Report and Order*, 12 FCC Rcd 22310 (1997).

[29] Each GSO/FSS licensee is required to begin construction of its first satellite within one year of grant, to begin construction of the remainder within two years of grant, to launch at least one satellite into each of its assigned orbit locations within five years of grant, and to launch the remainder of its satellites by the date required by the ITU to assure international recognition and protection of these satellites. Each NGSO/FSS licensee is required to begin construction of its first two satellites within one year of the unconditional grant of its authorization, and complete the construction of those first two satellites within four years of grant. Construction of the remaining authorized operating satellites in the constellation must begin within three years of the initial authorization, and the entire authorized system must be operational within six years. *See* 47 C.F.R. § 25.145(f).

[30] *See Public Notice*, Report No. 2208 (rel. July 1, 1997).

[31] The commenters are listed in Appendix A.

[32] Petitioners also request that a second proceeding be initiated to address sharing between GSO/FSS and terrestrial fixed service in the currently shared 17.7-18.8 GHz band. Because we are proposing a band plan that separates ubiquitous satellite service operations from terrestrial fixed service operations, we believe a second proceeding dealing with inter-service sharing issues, as recommended by Petitioners, is not necessary.

consumer costs, and administrative burdens on the Commission.[33]

15. Teledesic argues that similar considerations apply to NGSO/FSS earth stations and that blanket licensing has previously been used in shared bands by issuing blanket licenses but requiring the licensees to conduct coordination.[34] Accordingly, Teledesic requests that the proceeding be expanded to include blanket licensing procedures for all FSS earth stations operating in the Ka-band, including NGSO/FSS earth stations. Comments submitted by other Ka-band satellite interests also generally stress the need for blanket licensing.[35]

16. Terrestrial fixed service commenters argue that blanket licensing should not be allowed in frequency bands that are shared with the terrestrial fixed service. The Fixed Point-to-Point Communication Section of the Telecommunications Industry Association ("TIA-FPTP") contends that sharing of frequencies requires licensees in each service to coordinate their frequency usage.[36] TIA-FPTP states that such coordination is impossible if one of the services is blanket licensed and specific station locations are not identified. TIA-FPTP contends that if a satellite earth station must be protected and its location is unknown, then the entire blanket license area and an additional buffer zone outside of that area must be avoided. This protected area could be over 100 miles wide depending upon the characteristics of the satellite earth stations and the terrestrial system involved. TIA-FPTP argues that the inability to coordinate with blanket licensed earth stations at unspecified locations would have a substantial negative impact on terrestrial fixed users, and blanket licensing would in effect close off entire portions of the 18 GHz band to many existing and potential terrestrial fixed services.[37]

17. Some terrestrial fixed service commenters argue that frequency sharing with FSS is not feasible even if blanket licensing is not adopted. TIA-FPTP states that the integrity of terrestrial fixed service operating areas will be severely and adversely affected by the large "holes" or "exclusion zones" required to protect FSS earth station receivers.[38] GTE asserts that terrestrial fixed service and FSS are not compatible services and should not be required to share the same frequency block.[39] Harris states that sharing would only be viable if the number of FSS earth stations is limited or if FSS earth stations are deployed away from urban

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[33] Petition at 3.

[34] Teledesic initial comments at 3-5.

[35] Motorola comments at 4; PanAmSat comments at 1; TIA-Sat comments at 3.

[36] TIA-FPTP comments at 3.

[37] *Id.* at 15.

[38] *Id.* at 3.

[39] GTE comments at 6.

areas.[40]

B. General Considerations

18. In the *28 GHz First Report and Order*, the Commission recognized that there might be difficulties involved with sharing the 17.7-19.7 GHz band; however, there was no record to support redesignating the band to separate terrestrial fixed service and FSS at that time. In the present proceeding, we received petitions and comments describing: (1) the ubiquitous nature of the proposed satellite systems; (2) the need for blanket licensing of such systems; (3) the difficulty of blanket licensing in shared bands; and (4) the difficulty of sharing between ubiquitous satellite systems and terrestrial fixed services even without blanket licensing. Given the record in this proceeding, we now realize that there is a clear need to revisit sharing of the 17.7-19.7 GHz band.

19. We agree with satellite interests that given the large numbers of small FSS earth stations expected to be deployed, blanket licensing will probably be necessary to ensure the fast and efficient implementation of these new Ka-band services.[41] However, it appears that blanket licensing would make it impractical for terrestrial fixed service providers to coordinate new operations to avoid interference in shared frequency bands where blanket licensing is allowed. Furthermore, even without blanket licensing, the presence of large numbers of ubiquitously deployed small antenna earth stations could have a serious adverse effect on the ability of the terrestrial fixed service to start a new operation or expand existing operations in a shared band. After considering these factors, we tentatively conclude that the public interest is best served by redesignating the 17.7-19.7 GHz band to separate terrestrial fixed services from most satellite earth station operations.

20. Separating terrestrial fixed service operations from most GSO/FSS and NGSO/FSS operations will benefit the terrestrial fixed service in several ways. First, such separation would eliminate the need for new terrestrial fixed service operations to coordinate with satellite earth station operations. In addition, terrestrial fixed service operators looking to expand their operations would no longer run the risk of being precluded from large geographic areas by the introduction of a new satellite earth station or from a portion of the band by the presence of millions of satellite earth stations. Furthermore, without satellite earth stations in an area, a denser population of terrestrial fixed service operations would be possible.

21. Separating terrestrial fixed service operations from most GSO/FSS and NGSO/FSS operations will also benefit satellite operators. First, satellite operators would not be required to individually coordinate large numbers of satellite earth stations with terrestrial fixed service operations. We agree with Petitioners that individual coordination of satellite earth stations would be costly, time consuming, and would delay service to the end user. In

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[40] Harris comments at 3.

[41] *See infra.* Section III.D.

addition, satellite operators would not need special siting and shielding installations to avoid receiving interference from the operation of a terrestrial fixed service station. Finally, our band proposal would allow the adoption of efficient blanket licensing procedures for GSO/FSS and NGSO/FSS satellite earth stations in the bands earmarked for primary satellite use.

22. Although we propose to separate terrestrial fixed service from ubiquitous satellite operations, we do not think that such separation is necessary for all Ka-band satellite operations. In this regard, we note that Lockeed has indicated it is planning to use 500 MHz in the 17.7-18.8 GHz band for the operation of "Astrolink™" gateway earth stations.[42] These earth stations are expected to use relatively large diameter antennas and are not expected to be ubiquitously deployed. Sharing between the terrestrial fixed service and such non-ubiquitous satellite operations is feasible because the number of satellite earth stations is not large, because we are not proposing blanket licensing in these bands, and because their locations will be known. Therefore, current coordination criteria and sharing principles between satellite earth station and terrestrial fixed service operations can be used. Thus, we propose continued sharing in certain band segments. We anticipate that satellite operators will deploy large antenna diameter earth stations for specialized uses such as gateway terminals in these shared band segments.

23. Further, while we tentatively conclude that redesignating the 17.7-19.7 GHz band to separate terrestrial fixed service from ubiquitous satellite operations is the most practical solution, we also request comment on the feasibility of alternative proposals that would involve continued sharing in part or all of the 17.7-19.7 GHz band. We note that Petitioners and several commenters urge the creation of a joint working group to address inter-service sharing and coordination issues,[43] and that such a working group has been formed.[44] We support this industry effort and encourage the working group to file comments in this proceeding and to recommend alternative band sharing or separation approaches. We are aware from previous experience that developing a consensus in such a working group can be a lengthy process. Given the need to resolve satellite licensing issues on a timely basis and to protect the operations of existing terrestrial fixed service licensees, we believe the public interest will be served by offering proposals and requesting comments on the issues addressed in this NPRM.

C. Band Redesignation Proposals

24. In developing specific band redesignation proposals for this NPRM, we sought to identify the spectrum requirements of all services authorized to operate in the band and to

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[42] Lockeed comments at 6.

[43] Petition at 8; Motorola comments at 5; PanAmSat comments at 2; ABC comments at 3; GTE comments at 8; UTC comments at 4; NSMA comments at 3.

[44] *See* Letter from Robert J. Miller, Gardere & Wynne, L.L.P., to Ruth Milkman, Deputy Chief, International Bureau, Federal Communications Commission (Nov. 19, 1997).

strike a balance between the requirements of these different services and the public interest. While we recognize the difficulties involved in this process, we tentatively conclude that the band plans proposed below strike the appropriate balance, and will ensure both continued development of terrestrial fixed service and FSS in this band and efficient use of the spectrum. We request comment on whether we have fully identified the requirements of the various services, and whether we have identified band plans that best meet the public interest.

1. Spectrum Requirements

25. GSO/FSS. Satellite systems have typically been allocated equal blocks of uplink and downlink spectrum. In the United States, GSO/FSS systems are currently designated 1000 MHz of spectrum for use in the uplink portion of the Ka-band (28.35-28.6 GHz, 29.25-29.5 GHz, and 29.5-30.0 GHz) and 1.6 GHz of spectrum for use in the downlink portion of the Ka-band (17.7-18.8 GHz and 19.7-20.2 GHz). Of this 1.6 GHz of downlink spectrum, 500 MHz (19.7-20.2 GHz) is designated for GSO/FSS use on a primary basis and 1100 MHz (17.7-18.8 GHz) is designated for GSO/FSS and terrestrial fixed service use on a co-primary basis. The Commission made this disparate allocation to uplinks and downlinks in recognition that added flexibility was needed resulting from the requirement to share and coordinate with terrestrial fixed services in the 17.7-18.8 GHz band.[45] We tentatively conclude that if terrestrial fixed service and GSO/FSS sharing and coordination issues were resolved, only 500 MHz of the 1100 MHz in the 17.7-18.8 GHz band (when coupled with the 500 MHz in 19.7-20.2 GHz) would be required to match the 1000 MHz of uplink bandwidth allocated to GSO/FSS.

26. NGSO/FSS. In the United States, NGSO/FSS systems are currently designated 500 MHz of spectrum for use in the uplink portion of the Ka-band (28.6-29.1 GHz) and 500 MHz of spectrum for use in the downlink portion of the Ka-band (18.8-19.3 GHz). Thus, NGSO/FSS has equal amounts of uplink and downlink spectrum. The Ka-band downlink segment, however, is designated for co-primary use with terrestrial fixed services. With the likelihood that more than one NGSO/FSS system will operate in this band, and based on our belief that band redesignation will provide a fast, efficient, and cost effective way to make these services available to the public, we tentatively conclude that designating the existing 500 MHz of downlink spectrum on a primary use basis would be necessary to fulfill NGSO/FSS spectrum requirements.

27. Terrestrial Fixed Service. Terrestrial fixed services operating in the 17.7-19.7 GHz band include CARS, auxiliary broadcasting, local television transmission, fixed point-to-point, and low power point-to-multipoint. These terrestrial fixed service systems operate according to a channeling plan defined in the Commission's Rules.[46] This channeling plan includes frequency separations within the band primarily to accommodate two-way services. Thus, a redesignated band plan should accommodate frequency separations to enable these two-way systems to continue to operate. In addition, some CARS

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[45] *28 GHz First Report and Order*, 11 FCC Rcd at 19036.

[46] *See* 47 C.F.R. §§ 74.402, 78.18, 101.147.

facilities use Amplitude Modulated Link (AML) technology.[47] Cable operators use this technology to distribute their programming and typically use contiguous spectrum in the 17.7-19.7 GHz band. Terrestrial fixed service video operators (*e.g.*, satellite master antenna television operators) also typically use a contiguous block of spectrum.[48] Due to the difficulties of coordinating these point-to-multipoint operations with typical point-to-point terrestrial fixed service operations, these services have generally been licensed in separate portions of the 17.7-19.7 GHz band, although the Commission's Rules do not specify separate frequencies. Broadcast auxiliary operations typically employ contiguous blocks of spectrum, one use of which is for video and audio "back hauls" to support news gathering and other operations. The use of contiguous blocks of spectrum simplifies the design of mobile transmitters and receivers. These transmitters and receivers are designed to be operated over a wide frequency band to enable selection of a frequency that does not conflict with existing operations in a particular area. We tentatively conclude that 600 MHz of contiguous spectrum for CARS and broadcast auxiliary services along with a similar amount of spectrum separated in frequency from the contiguous block to accommodate point-to-point and two-way services should be sufficient to accommodate terrestrial fixed service needs.

28. Other Services. Other services in the 17.7-19.7 GHz frequency band include the Earth Exploration-Satellite ("EES") (passive) and Space Research ("SR") (passive) services[49] allocated at 18.6-18.8 GHz and Government satellite systems[50] operating throughout the 17.8-20.2 GHz band. It should be noted that non-Government terrestrial fixed service operations and non-Government satellite operations are required to coordinate with Government operations in the 17.8-20.2 GHz band.[51] In addition, the band segment 17.7-17.8 GHz is allocated by the ITU in the Americas ("Region 2") for terrestrial fixed service, FSS,[52] and BSS operations. As discussed below, we propose to implement this BSS

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[47] AML technology uses wideband transmitters to frequency shift multiple cable television channels for transmission at microwave frequencies. Since AML hub facilities are an integral part of a cable system, an average system of 78 channels using 550 MHz of RF bandwidth would require a minimum of 550 MHz of AML microwave spectrum. Cable systems with higher channel capacities (*e.g.*, 750 MHz) would require more microwave spectrum.

[48] Wireless cable and satellite master antenna systems typically use the same type AML equipment as CARS. However, they traditionally offer less programming than franchised cable operators and, thus, need only 440 MHz of contiguous spectrum.

[49] The band 18.6-18.8 GHz is allocated for both Government and non-Government EES (passive) and SR (passive).

[50] *Supra* note 3.

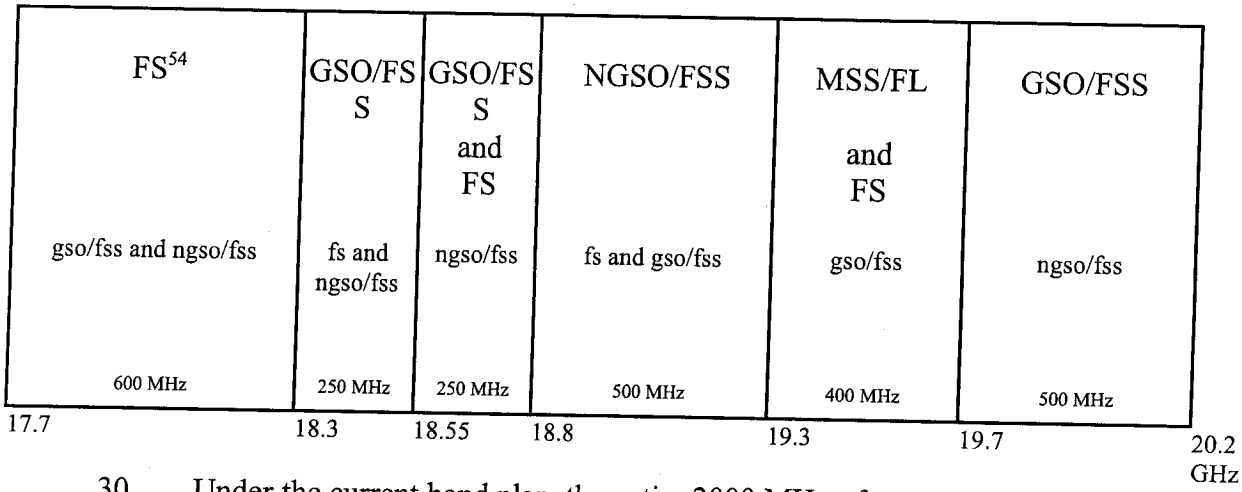
[51] For terrestrial fixed service operations, *see* Amendment of the Commission's Rules to Relocate the Digital Electronic Message Service From the 18 GHz Band to the 24 GHz Band and to Allocate the 24 GHz Band For Fixed Service, *Order*, ET Docket 97-99, 12 FCC Rcd 4990 (1997); *see also*, *Order*, ET Docket 97-99, 13 FCC Rcd 3581 (1997) (low power operations). For satellite services, *see* 47 C.F.R. § 2.106, Footnote US334.

[52] The 17.7-17.8 GHz band is allocated for use by the FSS in both the Earth-to-space and space-to-Earth directions. ITU Radio Regulations Footnote S5.516 limits the uplink use to feeder links for the BSS operating in the 12.2-12.7 GHz band. This footnote allocation is consistent with Footnote US271 in the United States Table of

allocation domestically to conform to the ITU Region 2 allocation.[53] Accordingly, any band redesignation plan should take into account the consequences of possible future sharing with BSS operations.

2. Primary Proposal

29. To accommodate these spectrum requirements, we propose the following band plan:



30. Under the current band plan, the entire 2000 MHz of spectrum in the 17.7-19.7 GHz band is shared between terrestrial fixed service and satellite services.[55] Under the proposed band plan we would redesignate this spectrum as follows. First, we propose to designate to terrestrial fixed service 600 MHz of spectrum for primary use at 17.7-18.3 GHz and 650 MHz of spectrum for co-primary use at 18.55-18.8 GHz and 19.3-19.7 GHz. The total amount of spectrum available for terrestrial fixed service use would be 1250 MHz. Second, we propose to designate to GSO/FSS 250 MHz of spectrum at 18.3-18.55 GHz for primary use and 250 MHz of spectrum at 18.55-18.8 GHz for co-primary shared use. The total amount of spectrum available for GSO/FSS use would be 500 MHz, in addition to the current designation of 500 MHz of spectrum for primary GSO/FSS use at 19.7-20.2 GHz. Third, we propose to designate to NGSO/FSS 500 MHz of spectrum at 18.8-19.3 GHz for primary use. Fourth, we propose that MSS/FL would retain the 400 MHz of spectrum at 19.3-19.7 GHz for co-primary shared use. We note that this proposal does not change the current

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Frequency Allocations and we propose no change to it in this NPRM.

[53] *See infra* Section III.E.

[54] We also propose that, effective April 1, 2007, the frequency segment 17.7-17.8 GHz be designated co-primary for both terrestrial fixed service and BSS downlink use. *See infra* Section III.E.

[55] *See infra* Section II.

designation for the 19.3-19.7 GHz band segment.[56] Finally, we propose to grandfather existing terrestrial fixed users in the bands being redesignated for primary satellite use. We tentatively conclude that FSS operators will generally be able to design their systems around these limited number of existing operations.

31. This proposed plan attempts to balance the needs of satellite services and terrestrial fixed services. We tentatively conclude that the proposed plan can accommodate the needs of terrestrial fixed services. First, as indicated above, 600 MHz of contiguous spectrum (17.7-18.3 GHz) would be designated for primary use by terrestrial fixed service. Portions of this spectrum could be used to accommodate CARS AML technology, terrestrial fixed service video operators, and broadcast auxiliary services. Second, terrestrial fixed service would have 650 MHz of spectrum designated for co-primary use at 18.55-18.8 GHz and 19.3-19.7 GHz. The 600 MHz of primary designated spectrum, in conjunction with the 650 MHz of co-primary designated spectrum, should permit the implementation of a terrestrial fixed service channeling plan that can accommodate two-way services. For example, 450 MHz of the 17.7-18.3 GHz band could be channelized similar to the current 18.142-18.58 GHz band for paired or unpaired video use. The remaining 150 MHz of the 17.7-18.3 GHz band, along with the 18.55-18.8 GHz band, could be paired with the 19.3-19.7 GHz band for other terrestrial fixed point-to-point services. Various channel bandwidths could be accommodated in this spectrum. Third, as discussed below, we propose to grandfather on a permanent co-primary basis existing terrestrial fixed service systems operating in the 18.3-18.55 GHz and 18.8-19.3 GHz bands that we propose to designate as primary for satellite services.[57]

32. We tentatively conclude that the proposed plan can also accommodate the needs of Ka-band satellite services. We propose to provide GSO/FSS with 1000 MHz of downlink spectrum, of which 750 MHz of spectrum would be designated on a primary basis. This primary spectrum (18.3-18.55 GHz and 19.7-20.2 GHz) could be used for ubiquitously deployed, blanket licensed satellite earth stations. We propose that the remaining 250 MHz of GSO/FSS downlink spectrum (18.55-18.8 GHz) be shared on a co-primary basis with the terrestrial fixed service. Although sharing with terrestrial fixed services in this 250 MHz of spectrum would place some constraints on GSO/FSS satellite licensees, we tentatively conclude that it would be possible for GSO/FSS satellite operators to use this spectrum to meet specialized demands, in particular, the demand for a limited number of large antenna diameter, high-data-rate terminals. As mentioned previously, Lockheed is planning to use 500 MHz in the 17.7-18.8 GHz band for the operation of "Astrolink™" gateway earth stations.[58] These earth stations are expected to use relatively large antenna diameters and are not expected to be

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[56] We intend to amend the Table of Frequency Allocations in Section 2.106 of the Commission's Rules to conform any changes resulting from a band plan we may adopt in this proceeding. Because we are seeking comment on several alternative variations to our proposal and for the sake of simplicity, we are not displaying in Appendix C to this NPRM proposed changes to the Table of Frequency Allocations.

[57] *See infra* Section III.C.4.

[58] Lockheed comments at 6.

ubiquitously deployed. We also note that the 18.6-18.8 GHz band is also allocated to the EES (passive) and SR (passive) services and a strict Power Flux Density ("PFD") limit is placed on fixed satellite service operations in this band.[59] Adherence to this PFD limit may require the use in this band of satellite earth stations with higher gain antennas and might serve as an incentive for licensees to concentrate smaller satellite earth stations in the 750 MHz of unshared GSO/FSS spectrum. For these reasons, and recognizing the need to provide adequate spectrum for both terrestrial fixed service and GSO/FSS, we tentatively conclude that sharing the 18.55-18.8 GHz band between GSO/FSS and terrestrial fixed service is an efficient use of this spectrum. The proposed band plan also provides NGSO/FSS with 500 MHz of primary downlink spectrum; this should satisfy NGSO/FSS spectrum requirements. We also tentatively conclude that, because of the limited number of MSS/FL earth stations in the 19.3-19.7 GHz band, sharing of this band by MSS/FL and terrestrial fixed services should continue under the current sharing requirements.[60] Accordingly, the 19.3-19.7 GHz spectrum band would continue to be designated for use by MSS/FL and terrestrial fixed services on a co-primary basis.

33. To provide flexibility throughout the 17.7-20.2 GHz band, we also propose to allow secondary operations on a non-interference basis by both terrestrial fixed service and FSS. These secondary operations are depicted in the proposed band plan by using lower case letters. We propose that, prior to initiating use of a frequency on a secondary basis, an applicant will be required to demonstrate that such use will not cause interference to users operating on a primary basis, and that it can accept interference from primary service operations. We request comment on the most efficient and effective way to demonstrate such use on a secondary non-interference basis.

3. Comment Requested and Modified Proposals

34. First, we request comment on whether the above proposal adequately meets the spectrum requirements of both terrestrial fixed service and GSO/FSS and NGSO/FSS satellite licensees. In particular, we seek comment on the feasibility of GSO/FSS operations in the 18.55-18.8 GHz band given the strict PFD limit that is imposed by the Commission's Rules on fixed satellite service operations in the 18.6-18.8 GHz band in order to protect EES (passive) and SR (passive) services in that portion of the band. We also seek comment on whether allowing secondary operations in the 17.7-20.2 GHz band is desirable and feasible. Currently, there exists a secondary designation for NGSO/FSS throughout the 17.7-18.8 GHz band; however, NASA has suggested that it may be difficult for NGSO/FSS to operate on a secondary basis in the 18.6-18.8 GHz band without causing interference to EES (passive) and

[59] In the band 18.6-18.8 GHz, the fixed satellite service shall be limited to a PFD at the Earth's surface of -101 dBW/m^2 in a 200 MHz band for all angles of arrival. *See* 47 C.F.R. § 2.106, footnote US255.

[60] See 47 C.F.R. §§ 25.203, 101.103.

SR (passive) operations. We seek comment on this issue.[61] We also seek comment on the impact of a potential future BSS allocation in the 17.7-17.8 GHz band segment on existing and future terrestrial fixed service operations[62] and on the efficiency of continued sharing of the 19.3-19.7 GHz band by terrestrial fixed service and MSS/FL operations. We also request proposals for a modified terrestrial fixed service channelization plan that would conform to our proposed band plan. Finally, we request comment on how continued terrestrial fixed service access to the band can be ensured.

35. Second, we request comment on the merits of modifying our proposal by designating an additional 100 MHz at 18.3-18.4 GHz to be shared on a co-primary basis by terrestrial fixed service and GSO/FSS. Under our primary proposal, 600 MHz (17.7-18.3 GHz) is designated for terrestrial fixed service use while the adjacent 250 MHz (18.3-18.55 GHz) is designated for GSO/FSS use. However, if the 100 MHz at 18.3-18.4 GHz could be shared, terrestrial fixed service would have 700 MHz of contiguous spectrum (17.7-18.4 GHz) and this larger block of contiguous spectrum might make it possible for a more flexible terrestrial fixed service channeling plan to be devised.[63] We seek comment on whether this adjustment to our proposed band plan would more fully meet terrestrial fixed service needs while not being overly restrictive of proposed GSO/FSS operations. We also request proposals for terrestrial fixed service channeling plans that would conform to this proposal.

36. Third, we request comment on modifying our primary proposal by designating the entire 17.7-18.8 GHz band to be shared on a co-primary basis by terrestrial fixed service and GSO/FSS. In developing our proposed band plan we assumed that GSO/FSS might use gateways or other large antenna earth stations at 18.55-18.8 GHz, thus, making sharing feasible in that portion of the band, but that elsewhere in the 17.7-18.8 GHz band GSO/FSS would use ubiquitously deployed small antenna earth stations that would make sharing impractical. It may be possible, however, for GSO/FSS to use gateway type terminals throughout the 17.7-18.8 GHz band, in which case continued sharing might be possible. We seek comment on this issue and on whether continued sharing in the 17.7-18.8 GHz band would better meet the needs of GSO/FSS and terrestrial fixed service licensees.

37. If the 17.7-18.8 GHz band continues to be shared by terrestrial fixed service and GSO/FSS, two different approaches could be taken with regard to licensing in this band. The first approach would maintain the status quo; that is, we would not allow blanket licensing. Licenses would continue to be required for each individual satellite earth station facility and each facility would be individually coordinated. The second approach would involve issuing a blanket license, but requiring terrestrial fixed and GSO/FSS licensees to

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[61] We acknowledge NASA's concerns; however, we believe that further study of the potential impact of secondary operation of NGSO/FSS systems in the 18.6-18.8 GHz band is necessary before the Commission changes the NGSO/FSS secondary designation.

[62] *See infra* Section III.E.

[63] *Infra* Section III.C.1 Terrestrial Fixed Service.

coordinate prior to installation of a facility. Under the second approach, we propose that GSO/FSS licensees be required to maintain a database of earth station locations and operating parameters. Although each facility would still undergo coordination, we believe that this second approach could make licensing considerably faster. We request comments on whether either of these is an effective approach, and which approach best meets the needs of both GSO/FSS and terrestrial service licensees. We also request comment on whether there are other ways to streamline the existing coordination process. In addition, we request comment on whether current inter-service sharing criteria need to be amended. Also, we request proposals for a modified terrestrial fixed channelization plan that would conform to this proposal.

38. Fourth, we request comment on the feasibility of retaining our current band plan and thus continuing to share the entire 17.7-19.7 GHz band. Although we believe that band redesignation offers the best solution, we recognize that other solutions are possible. Accordingly, we seek comment on whether there are any streamlined licensing and coordination procedures that would allow satellite earth stations to be deployed in an efficient cost effective manner in a shared 17.7-19.7 GHz band. In addition, we request comment on any other band plans that might best accommodate the needs of both terrestrial fixed service and FSS licensees.

39. Fifth, we note that some of the Ka-band satellite licensees are planning to offer their services both domestically and internationally. Although the band plan we adopt will apply only domestically, we request comment on what effect this band plan would have internationally. We seek comment on whether our proposed band plans would allow equipment manufacturers to make satellite earth stations that can be used both domestically and internationally. In addition, we seek comment on how these plans would affect the manufacturing of terrestrial fixed service transmitters and receivers. We also seek comment on whether a detailed terrestrial fixed service channelization plan would be necessary to facilitate the cost-effective manufacturing of microwave transmitters and receivers for domestic and international markets.

4. Grandfathering

40. In evaluating options for the 18 GHz band, we also need to consider the investments made by existing primary users in the band. There are no commercial satellite systems currently operating in the Ka-band,[64] but there are existing terrestrial fixed service systems operating in the band. To protect the existing investment in terrestrial fixed service operations and, at the same time, anticipating that such existing operations would not overly restrict new satellite operations, we propose to grandfather terrestrial fixed service operations that have been either licensed or for which applications are pending, as of the release date of this NPRM, for any band that is proposed to be designated for fixed satellite service use on a primary basis. Under this proposal, new terrestrial fixed service applications could continue to

[64] We note that Government military operations exist in this band and their operations must be protected. *Supra* note 3.

be filed and granted after the NPRM release date, but the licensees would have only secondary status in those bands designated for fixed satellite service use on a primary basis. Under the proposed band plan, for example, this would apply to the 18.3-18.55 GHz and 18.8-19.3 GHz bands. Due to the sensitivity of satellite earth station receivers, the most likely case of interference involves satellite earth stations receiving unwanted signals from terrestrial fixed service operations. Since detailed technical operating parameters (including specific location information) for these terrestrial fixed stations exist, we tentatively conclude that satellite operators will be able to design their systems and locate their facilities to avoid reception of such interference. Under this proposal, grandfathered terrestrial fixed service operations would receive interference protection from satellite operations and satellite earth stations must accept whatever interference they receive from those grandfathered terrestrial fixed service operations. We propose that new satellite earth stations will have to coordinate with grandfathered terrestrial fixed service operations, but that, grandfathered terrestrial fixed service licensees would not be allowed to expand or change their current operations in any of the bands in which grandfathering applies in any manner that might increase interference to satellite earth stations. For those terrestrial facilities applied for after the release of the NPRM, we reiterate that such terrestrial facilities will be required to accept interference from satellite operations and if a terrestrial facility interferes with a satellite earth station, and the terrestrial licensee can not cure it, the terrestrial licensee would be required to discontinue the operation of the interfering facility. We request comment on this grandfathering proposal.

41. In addition, if satellite operators are unable to design their systems to avoid interference from existing terrestrial fixed service operations, relocation of some or all terrestrial facilities (elsewhere within the 17.7-19.7 GHz band or another frequency band allocated for terrestrial fixed service) may be desirable. In order to balance the needs of both existing terrestrial fixed and future satellite systems, we request comment on the conditions under which relocation might become necessary. Commenters should specifically address the advantages and disadvantages to wholesale relocation of all incumbent users in any band in which grandfathering applies, as opposed to relocating only those links that are likely to cause interference. We note that in bands where terrestrial fixed service is primary or co-primary, no relocation will be required. We also request comment on whether we should allow satellite operators to force the relocation of individual terrestrial fixed service stations as long as the satellite operator pays all relocation costs. Commenters should also discuss how a case-by-case relocation process could be constructed, and whether it would impose undue burdens on licensees, the public, or the Commission. Relocation of terrestrial facilities was addressed in our Emerging Technology proceeding, ET Docket No. 92-9,[65] and Mobile Satellite Service at

[65] *See* Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, *First Report and Order and Third Notice of Proposed Rule Making*, 7 FCC Rcd 6886 (1992); *Second Report and Order*, 8 FCC Rcd 6495 (1993); *Third Report and Order and Memorandum Opinion and Order*, 8 FCC Rcd 6589 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 1943 (1994); *Second Memorandum Opinion and Order*, 9 FCC Rcd 7797 (1994).

2 GHz allocation proceeding, ET Docket No. 95-18.[66] In the event general relocation of terrestrial fixed service operations becomes necessary, we request comment on whether the relocation principles discussed in those proceedings should be applied here. Commenters should also discuss alternative relocation mechanisms and improvements to Commission procedures that would facilitate general or specific relocation of existing terrestrial fixed service facilities.

42. An exception to the preceding discussion on grandfathering involves low power point-to-multipoint terrestrial fixed systems. Since these systems are limited to an equivalent isotopically radiated power of 1 watt, we do not anticipate that the operation of these systems will cause harmful interference to FSS earth station operations. We propose to continue licensing these low power point-to-multipoint systems in the 18.82-18.87 GHz and 19.16-19.21 GHz bands on a primary basis. We request comment on whether and under what conditions continued licensing and operation of these systems could cause harmful interference to FSS satellite earth stations operating in the specified bands, and we seek proposals on methods to resolve such interference.

D. Blanket Licensing

43. As discussed above, we recognize that blanket licensing of FSS earth stations in band segments that are shared with terrestrial fixed services could present certain difficulties.[67] If blanket licensing were adopted without requiring coordination of individual earth stations, then, as TIA-FPTP notes, large areas could be closed to terrestrial fixed service use. It could be possible to adopt blanket licensing but require terrestrial fixed service and FSS licensees to coordinate prior to installing a facility. The Commission's Rules currently define a coordination procedure for frequency bands shared between satellite and terrestrial fixed services.[68] While this coordination method can be effective in bands where there are limited numbers of individually licensed satellite earth stations, it may prove burdensome once large numbers of satellite earth stations are present. In this case, the growth of terrestrial fixed service and the future deployment of satellite earth stations may be hindered. We tentatively conclude that coordination between terrestrial fixed service facilities and a large number of satellite earth stations will significantly add to the cost and time to implement satellite services and will adversely affect the ability of the public to receive the benefits of these new satellite services and also delay terrestrial deployment. We further tentatively conclude that, given our band redesignation proposal, satellite earth station blanket licensing would be possible in some sub-bands, while still allowing terrestrial fixed service operators primary or co-primary

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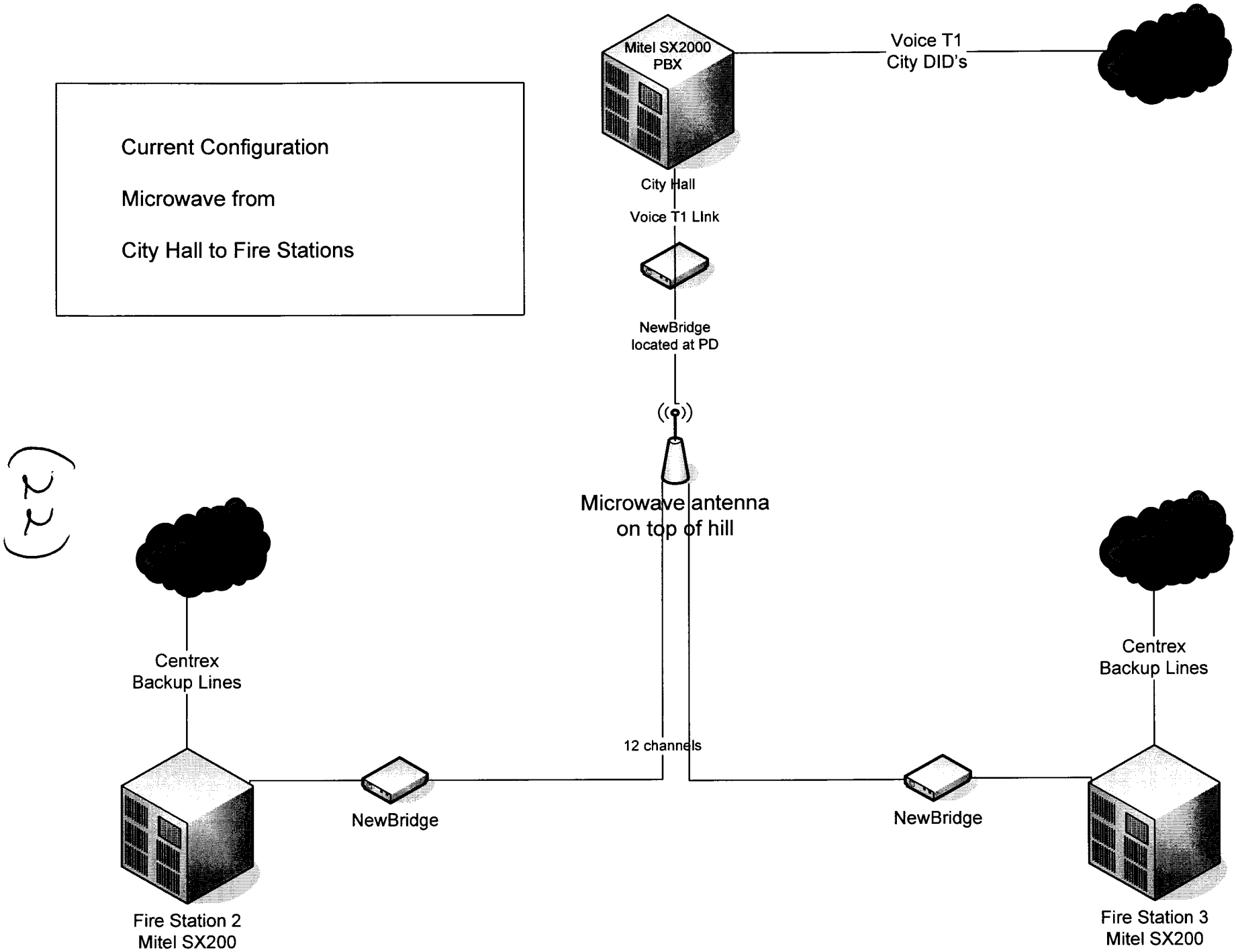
[66] See Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, *First Report and Order and Further Notice of Proposed Rule Making,* 12 FCC Rcd 7388, 7396-7407; 7414-21 (1997).

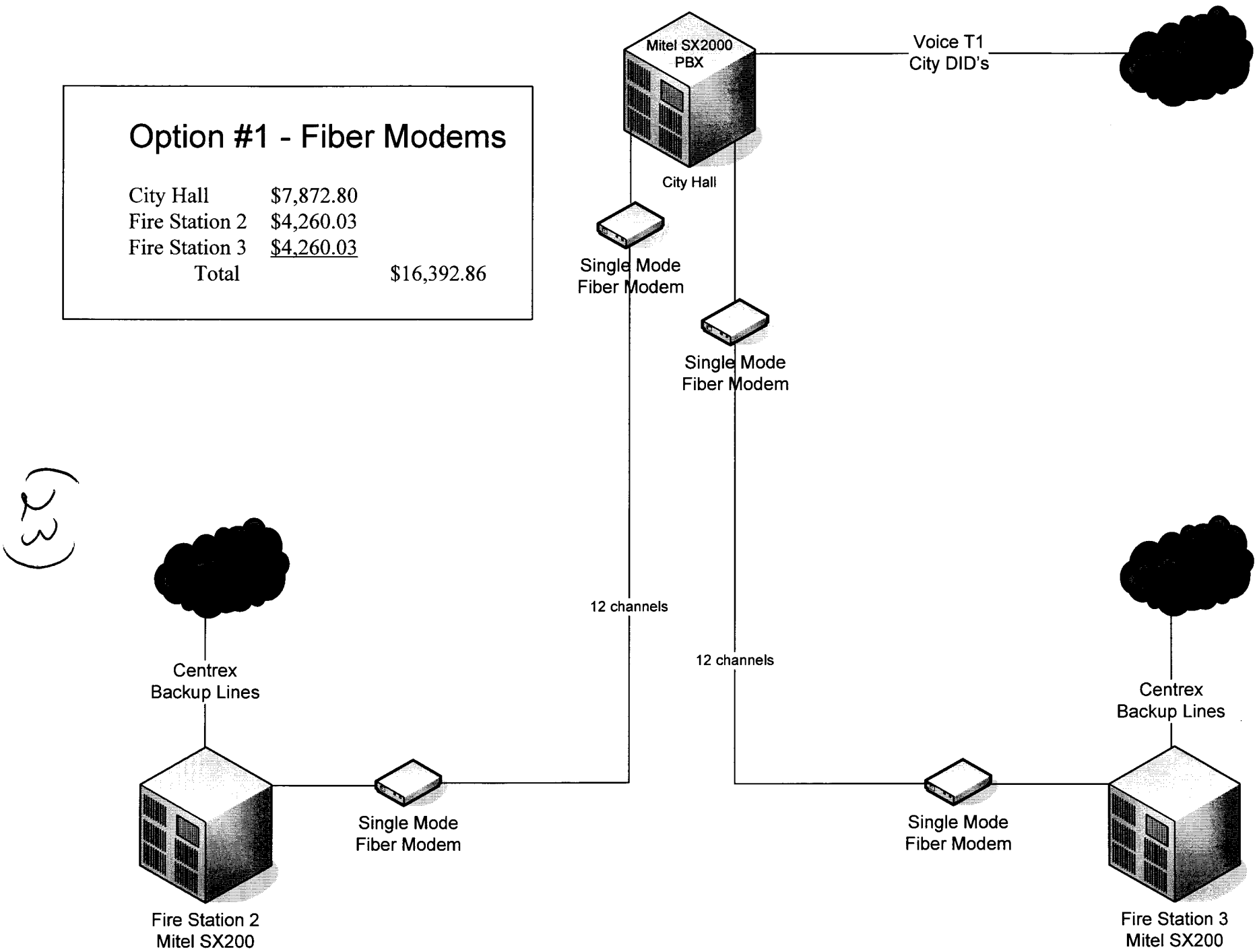
[67] This discussion of blanket licensing applies only to FSS earth stations. The frequency band 19.3-19.7 GHz is shared between terrestrial fixed service and MSS/FL. MSS/FL earth stations are not ubiquitously deployed, do not require blanket licensing, and a coordination procedure is already in place (*See* 47 C.F.R. §§ 25.203, 101.103).

[68] *See* 47 C.F.R. §§ 25.203, 101.103.


Current Configuration
Microwave from
City Hall to Fire Stations
Mitel SX2000
PBX
Voice T1
City DID's
City Hall
Voice T1 LInk
NewBridge
located at PD
Microwave antenna
on top of hill
Centrex
Backup Lines
12 channels
Centrex
Backup Lines
NewBridge
NewBridge
Fire Station 2
Mitel SX200
Fire Station 3
Mitel SX200

Option #1 - Fiber Modems

City Hall	$7,872.80	
Fire Station 2	$4,260.03	
Fire Station 3	$4,260.03	
Total		$16,392.86



(23)

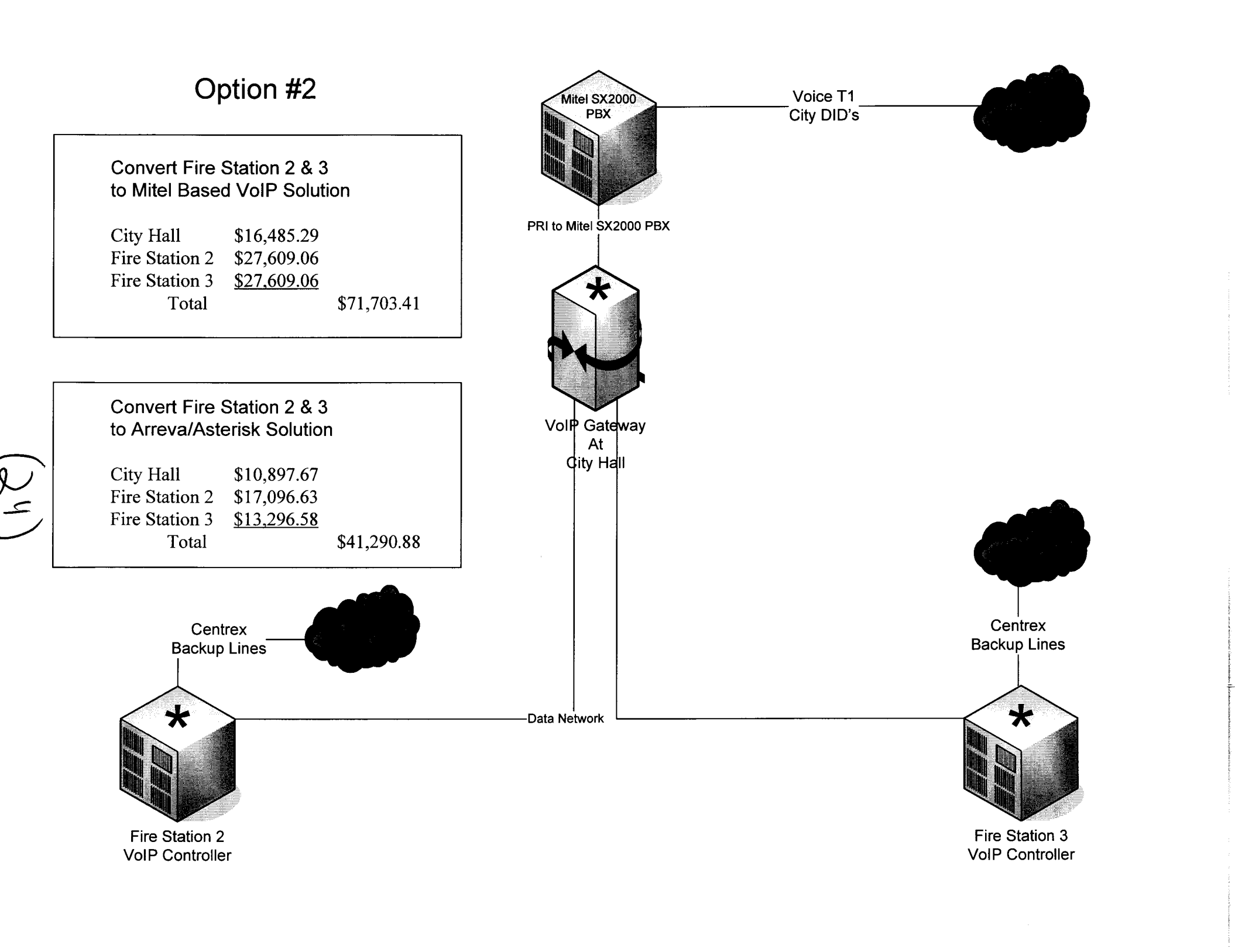
Option #2

Convert Fire Station 2 & 3
to Mitel Based VoIP Solution

City Hall	$16,485.29	
Fire Station 2	$27,609.06	
Fire Station 3	$27,609.06	
Total		$71,703.41

Convert Fire Station 2 & 3
to Arreva/Asterisk Solution

City Hall	$10,897.67	
Fire Station 2	$17,096.63	
Fire Station 3	$13,296.58	
Total		$41,290.88



Option #3

Mitel ICP3300 Gateways at
City Hall and Fire Station 2 & 3

City Hall	$16,485.29	
Fire Station 2	$7,123.88	
Fire Station 3	$7,123.88	
Total		$30,733.05

Arreva/Asterisk Gateways at
City Hall and Fire Station 2 & 3

City Hall	$10,897.67	
Fire Station 2	$10,897.67	
Fire Station 3	$10,897.67	
Total		$32,693.01

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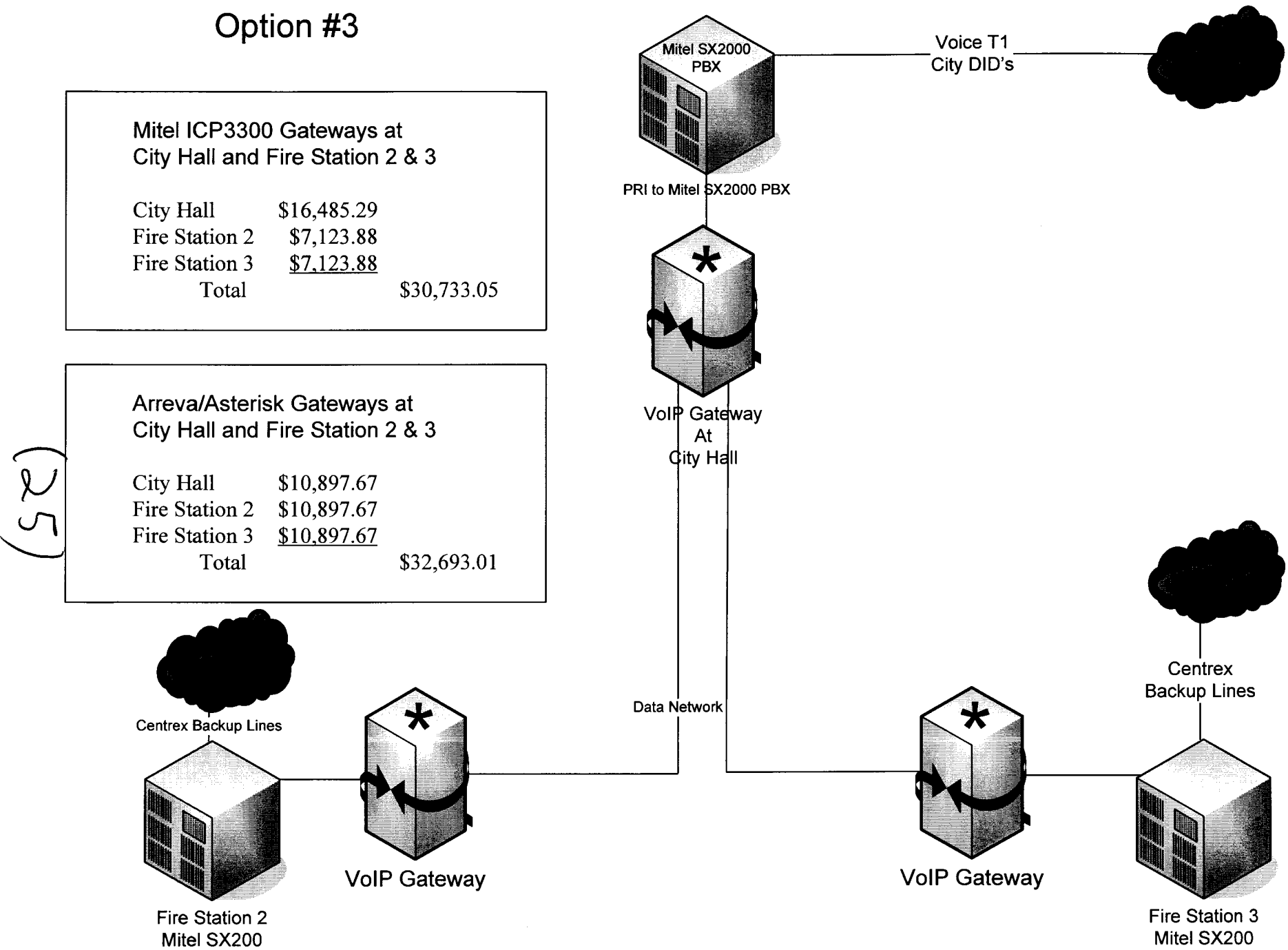


Option #4

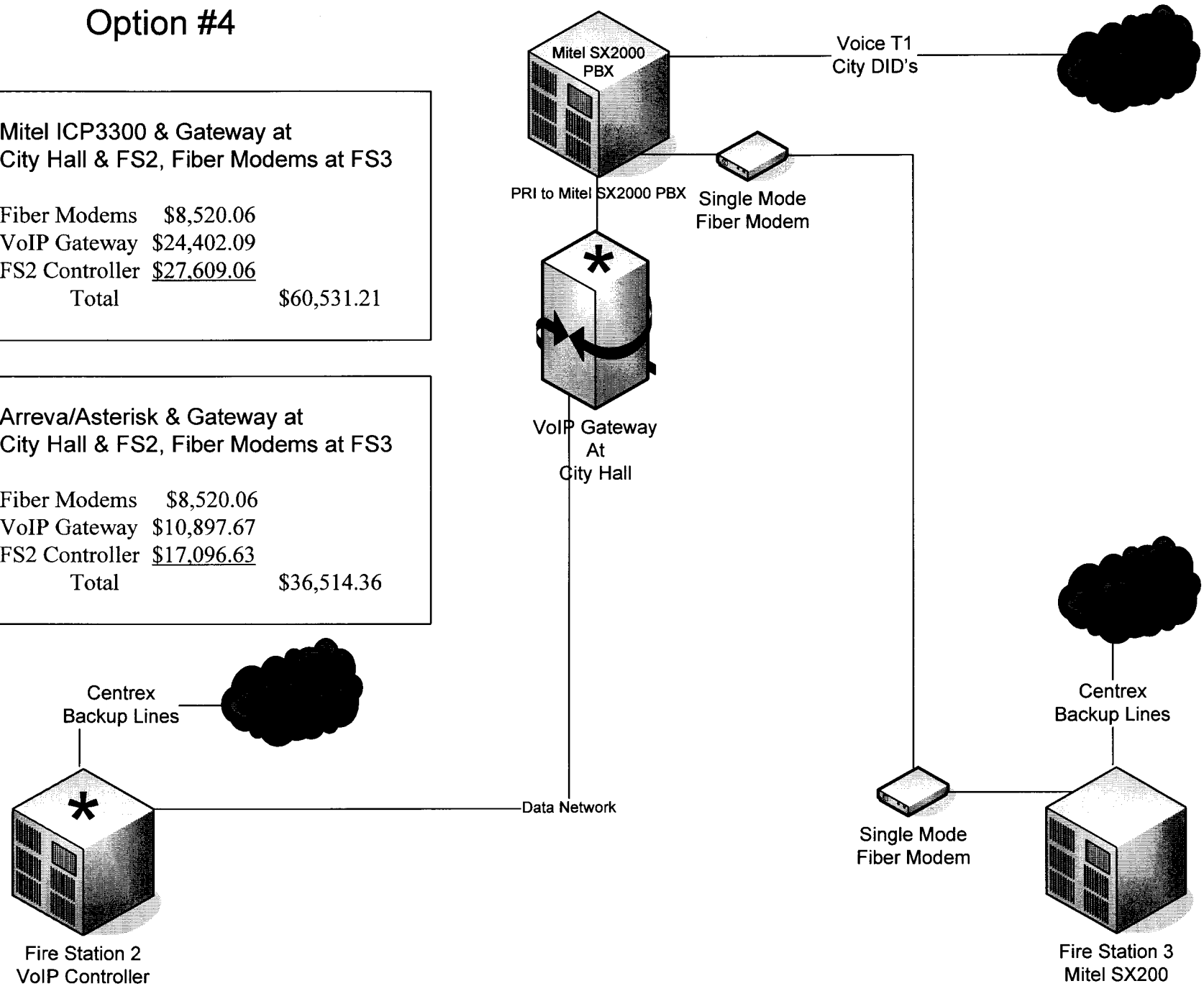
Mitel ICP3300 & Gateway at
City Hall & FS2, Fiber Modems at FS3

Fiber Modems	$8,520.06	
VoIP Gateway	$24,402.09	
FS2 Controller	$27,609.06	
Total		$60,531.21

Arreva/Asterisk & Gateway at
City Hall & FS2, Fiber Modems at FS3

Fiber Modems	$8,520.06	
VoIP Gateway	$10,897.67	
FS2 Controller	$17,096.63	
Total		$36,514.36

(92)



Proposal

Arreva Communications LLC

Quote Number:	446
Date:	01-17-2008
Sales Person:	Bob Murphy
Valid Until:	01-31-2008
Payment Terms:	50% Deposit ARO/50%

Bill To	Ship To
Ruben Arellano	Ruben Arellano
City of Culver City	City of Culver City
9770 Culver Blvd.	9770 Culver Blvd.
Culver City, CA 90232	Culver City, CA 90232
USA	USA

Main Site SIP Gateway

Quantity	Part Number:	Product	List Price	Unit Price	Ext. Price
1	3025-SIPG	Indigo 3025 Enterprise SIP Gateway 3025 Enterprise Appliance SIP Gateway - 3RU Dual Ethernet with PRIqsig... Upgraded RAM to 1 GB from 512 MB. RAID 1 Redundant with additional power supply module.	$9,495.00	$8,000.00	$8,000.00
1	TE120P	Digium TE120P The Digium Wildcard TE120P is a single span, selectable T1 (24-channel), E1 (32-channel), or J1 (24-channel) card. The card utilizes Digium's VoiceBus technology. VoiceBus technology allows the TE120P to use an industry standard bus-mastering PCI interface, as found in millions of PCs worldwide, to maximize system compatibility and eliminate system conflicts	$499.00	$499.00	$499.00
12	ARR_PROSERV	Arreva Professional Services Arreva Professional Services. Includes pre-configuration and testing at Arreva facilities and on-site installation. Does NOT include any cabling required to connect end points to PBX or extension of Telco Demarcation.	$195.00	$145.00	$1,740.00

Subtotal:	$10,239.00
Tax:	$658.67
Shipping:	$0.00
Total:	$10,897.67

Firestation 2 VoIP PBX

Quantity	Part Number:	Product	List Price	Unit Price	Ext. Price
1	3025-ENT	Indigo 3025 Enterprise Appliance The Indigo 3025 Enterprise Office Appliance is perfect for the small business. An all-in-one communications appliance that delivers all the features of an enterprise class PBX in an affordable solution. For business up to 25 handsets. Call center feature set inculded... Upgraded RAM to 1 GB from 512 MB. RAID 1 Redundant with additional power supply.	$7,495.00	$6,125.00	$6,125.00
1	TDM808B	Digium TDM 808B Provides an industry first with 8 standard two-wire, RJ-11 interfaces on a single PCI bracket... THIS CARD SUPPORTS up to 8 FXO LINES.	$895.00	$875.00	$875.00

1	TDM 40BF	Digium TDM 40BF Supports from up to four telephone interfaces for connecting analog telephones or analog lines... THIS CARD SUPPORTS up to 4 FXS LINES.	$495.00	$475.00	$475.00
17	IP 550	Polycom SoundPoint IP550 The Polycom IP 550 SoundPoint desktop phone features Polycom?s revolutionary HD Voice? technology, which brings life-like richness and clarity to every call. Polycom HD Voice technology incorporates wideband audio for over twice the voice clarity; Polycom?s patented Acoustic Clarity Technology for crystal-clear, noise- and echo-free sound, plus best-in-class system design for high-fidelity, faithful voice reproduction.	$369.00	$275.00	$4,675.00
20	ARR_PROSERV	Arreva Professional Services Arreva Professional Services. Includes pre-configuration and testing at Arreva facilities and on-site installation. Does NOT include any cabling required to connect end points to PBX or extension of Telco Demarcation.	$195.00	$145.00	$2,900.00
17	ARR_MAINT-25	Arreva Maintenance < 25 user Annual Maintenance for systems below 25 users Includes: 3 Add/Move/Changes per year (Remote), Software bug fixes and updates are included as long as customer remains under support. Replacement hardware is done on a best effort basis.	$74.00	$45.00	$765.00
4	2DAY	2nd Day Second Day Support, Arreva Communications will send a technician on site for system and telephone training. (Minumum 3 hours)	$85.00	$85.00	$340.00

Subtotal:	$16,155.00
Tax:	$941.63
Shipping:	$0.00
Total:	$17,096.63

Firestation 3 VoIP PBX

Quantity	Part Number:	Product	List Price	Unit Price	Ext. Price
1	3025-ENT	Indigo 3025 Enterprise Appliance The Indigo 3025 Enterprise Office Appliance is perfect for the small business. An all-in-one communications appliance that delivers all the features of an enterprise class PBX in an affordable solution. Call center feature set inculded... Upgraded RAM to 1 GB from 512 MB. RAID 1 Redundant with additional power supply.	$7,495.00	$6,125.00	$6,125.00
1	TDM808B	Digium TDM 808B Provides an industry first with 8 standard two-wire, RJ-11 interfaces on a single PCI bracket... THIS CARD SUPPORTS up to 8 FXO LINES.	$895.00	$872.00	$872.00
1	TDM 40BF	Digium TDM 40BF Supports from up to four telephone interfaces for connecting analog telephones or analog lines... THIS CARD SUPPORTS up to 4 FXS LINES.	$495.00	$475.00	$475.00

8	IP 550	Polycom SoundPoint IP550 The Polycom IP 550 SoundPoint desktop phone features Polycom?s revolutionary HD Voice? technology, which brings life-like richness and clarity to every call. Polycom HD Voice technology incorporates wideband audio for over twice the voice clarity; Polycom?s patented Acoustic Clarity Technology for crystal-clear, noise- and echo-free sound, plus best-in-class system design for high-fidelity, faithful voice reproduction.	$369.00	$275.00	$2,200.00
15	ARR_PROSERV	Arreva Professional Services Arreva Professional Services. Includes pre-configuration and testing at Arreva facilities and on-site installation. Does NOT include any cabling required to connect end points to PBX or extension of Telco Demarcation.	$195.00	$145.00	$2,175.00
8	ARR_MAINT-25	Arreva Maintenance < 25 user Annual Maintenance for systems below 25 users Includes: 3 Add/Move/Changes per year (Remote), Software bug fixes and updates are included as long as customer remains under support. Replacement hardware is done on a best effort basis.	$74.00	$45.00	$360.00
4	2DAY	2nd Day Second Day Support, Arreva Communications will send a technician on site for system and telephone training. (Minumum 3 hours)	$85.00	$85.00	$340.00

Subtotal:	$12,547.00
Tax:	$749.58
Shipping:	$0.00
Total:	$13,296.58

Grand Total

Currency:	USD	Subtotal:	$38,941.00
Tax Rate:	7.75%	Tax:	$2,349.88
Shipping Provider:		Shipping:	$0.00
		Total:	$41,290.88