

RECEIVED

FEB 27 1992

Federal Communications Commission
Office of the Secretary

PR 92-169

PUBLIC SAFETY RADIO
COMMUNICATIONS PLAN
FOR
* REGION 53 *
THE STATE OF TEXAS



CITY OF SAN ANTONIO

P. O. BOX 839966
SAN ANTONIO, TEXAS 78283-3966

February 11, 1992

RECEIVED

Ms. Donna Searcy
Secretary
Federal Communications Commission
Washington, D.C. 20554

FEB 27 1992

Federal Communications Commission
Office of the Secretary

Dear Ms. Searcy:

As chairperson of the Region 53 National Public Safety Planning Advisory Committee (NPSPAC), I am proud to present for your consideration our committee's Frequency Utilization Plan for the State of Texas, Region 53, formulated in accordance with FCC Dockets 87-112 and 87-359.

As the convener for Region 53, I communicated with all of the Council of Governments with the Region 53 area, numerous Police Chiefs, Fire Chiefs, Federal Law Enforcement Officials, State Law Enforcement Officials, Probation and Parole Officials, Corrections Officials, Mental Health, Emergency Planners, Forestry, and concerned citizens. I requested their ideas, thoughts and inputs. As soon as I completed this I issued a Public Notice December 2, 1991 that the initial Region 53 Public Safety Planning meeting would be held December 4, 1991 at 2:00PM in the Alamo Area Council of Governments office, 118 Broadway San Antonio, Texas.

In addition, to this official notice, I invited each individual I spoke with (described above) to attend this meeting. This initial regional planning meeting officially established the Region 53 Planning Committee with Don Brooks elected as Chairperson by quorum. Participants in this meeting represented Public Safety Radio Services, Special Emergency Service and the Vendor community. Please note that Vendors were encouraged to attend and offer their thoughts and insights, but they were not allowed to vote.

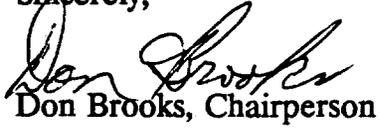
As Chairperson of Region 53, I compiled all inputs from the Regional Planning Committee members and developed a final draft. January 2, 1992 I sent copies of the Region 53 final draft to the Region 49 Chairperson Haislet; Region 50 Chairperson McDaniel; and Region 51 Chairperson Zeringue requesting their review and critique of the Region 53 Plan. I also mailed copies of the Region 53 final draft to all members of the Planning Committee and to all Council of Governments in the Region 53 area.

The final acceptance meeting was held January 15, 1992 at 10:00am in the Alamo Area Council of Government's office 118 Broadway San Antonio, Texas.

The final document is proof that a diverse group of individuals and organizations can come together and work for the good of the community and citizens they serve.

Please call me at (512)299-7022 or by fax at (512)299-7072, if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Don Brooks". The signature is written in a cursive style with a large initial "D".

Don Brooks, Chairperson

Region 53

City of San Antonio

P.O. Box 839966

San Antonio, Texas 78283-3966

**ITEMS TO CHECK PERTAINING TO THE
REGION 53 PLAN**

1. Cover page identifies the region.
2. Chairperson's name, address, phone number, and signature.
PAGE 106.
3. Committee members' names, organizational affiliations, addresses, and phone numbers. SEE PAGE 106, 107.
4. Summary of major elements of the plan. SEE PAGE 2
5. General description how spectrum is allotted among users
SEE PAGE 10.
6. Explanation how the plan has been coordinated with adjacent regions.
SEE PAGE 105.
7. Explanation how eligibles are prioritized in areas where not all eligibles may receive licenses. SEE PAGE 105.
8. Explanation how the plan has been coordinated with adjacent regions.
SEE PAGE 18.
9. Description how plan puts spectrum to the best possible use by
 - I. requiring system design with minimum coverage areas.
SEE PAGE 12.
 - II. assigning frequencies so that maximum frequency reuse and offset channel use may be made. SEE PAGE 16.
 - III. making use of trunking. SEE PAGE 21.
 - IV. requiring small entities with minimal requirements to join together on a single system, where possible. SEE PAGE 21.
10. Explanation how interoperability channels are managed. SEE PAGE 8.
11. Slow growth language. SEE PAGE 23.
12. Region 53's plan features "GIVE BACK" frequencies. SEE PAGE 15.
13. Use of the APCO/CET sorting program. SEE PAGE 27.
14. Does the Region 53 provide for regional mutual aid channels in addition to the five (5) common channels? **NO.**

15. Planning Committee formation

- I. Advertising, letters, TLETS bulletin. SEE APPENDIX A PAGE 108.
- II. Who could vote? Procedure used after first meeting. SEE PAGE 106.
- III. How was the Region 53 plan adopted? By vote of those in attendance.

I hope you find this check list helpful as you are reviewing the Region 53 plan.

Sincerely,



Don Brooks, Chairperson
Region 53

TABLE OF CONTENTS

1.0 SCOPE	4
1.1 Introduction	4
1.2 Purpose	5
2.0 AUTHORITY	5
2.1 Regional Planning Committee	5
2.2 Planning Committee Formation	7
2.3 National Interrelationships	8
2.4 Federal Interoperability	8
2.5 Regional Review Committee	9
3.0 SPECTRUM UTILIZATION	9
3.1 Region Defined	9
3.2 Region Profile (Demographic)	10
3.2.1 Region 53 Population	10
3.2.2 Geographical Description	10
3.3 Usage Guidelines	10
3.4 Technical Design Licensing Requirements	12
3.4.1 Definition of Coverage Area	12
3.4.2 System Coverage Limitations	12
3.4.3 Determination of Coverage	13
3.4.4 Annexation and Other Expansions	14
3.4.5 Coverage Area Description	15
3.4.6 Give Back Frequencies	15
3.4.7 Unused Spectrum	16
3.4.8 Adjacent Region Coordination	16
3.5 Initial Spectrum Allocation	16
3.5.1 Frequency Sorting Methodology	16
3.5.2 Geographic Area	17
3.5.3 Define the Environment	17
3.5.4 Blocked Channels	17
3.5.5 Transmitter Combining	17
3.5.6 Special Considerations	18
3.5.7 Protection Ratios	18
3.5.8 Adjacent Region Considerations	18

4.0	COMMUNICATIONS REQUIREMENTS	18
4.1	Common Channel Implementation	18
4.1.1	Areas of Operation	19
4.1.2	Operation on Common Channels	19
4.1.3	Operation Procedures	20
4.1.3	International Calling Channel (ICALL)	20
4.1.3	International Tactical Channels (ITAC1 - ITAC4)	20
4.1.4	Coded Squelch	20
4.2	Network Operating Method	21
4.3	Requirements For Trunking	21
4.4	Channel Loading Requirements	22
4.4.1	Loading Tables	23
4.4.2	Traffic Loading Study	23
4.4.3	Slow Growth	23
4.5	Use of Long Range Communications	24
4.6	Expansion of Existing Systems	24
5.0	IMPLEMENTATION AND PROCEDURES	24
5.1	Notification	24
5.2	Frequency Allocation Process	25
5.3	Region 53 Map	26
5.4	Data Packing Plan	27
5.5.1	Region 53 Channel Assignment (numerical order)	38
5.5.2	Region 53 Channel Assignment (by County)	53
5.5.3	Region 53 Sites and Excluded Channels	56
5.5.4	Region 53 Sites, Co-Channel and Adjacent Channel Users	63
5.6	Assignment Statistics	105
5.7	Expansion of Initial Allocation	105
5.8	Prioritization of Applicants	105
5.9	Appeal Process	106
6.0	REGIONAL PLANNING COMMITTEE	106
	APPENDIX A	108
	APPENDIX B	122
	APPENDIX C	125
	APPENDIX D	155

1.0 SCOPE

1.1 Introduction

In December of 1983, the United States Congress directed the Federal Communications Commission (FCC) to establish a plan to ensure that the communications needs of state and local public safety authorities would be met. By their regular means of initiation, the FCC began the process of developing such a plan. Through their efforts, and the efforts of the National Public Safety Planning Advisory Committee (NPSPAC) the plan was begun.

The National Public Safety Planning Advisory Committee provided an opportunity for the public safety community and other interested members of the public to participate in an overall spectrum management approach by recommending policy guidelines, technical standards, and procedures to satisfy public safety needs for the foreseeable future. After consideration of NPSPAC's Final Report and comments filed in Docket No. 87-112, a Report and Order was released by the FCC in December 1987, which established a structure for the National Plan that consists of guidelines for the development of regional plans.

The National Plan provides guidelines for the development of regional plans. The particulars of this plan are found in FCC 87-359, which contains the required steps and contents for regional plan development. It is on this document that this plan is developed.

1.2 Purpose

Public safety communications has, for many years, been inadequate throughout the United States. This is as true for Texas as it is for any other state. Many, if not all, public safety radio users are constantly bombarded with outside interference, noise, and over crowding. It is with these problems in mind that this plan was developed.

This regional plan was developed with the objective of assuring all levels of public safety/public service agencies that radio communications in the near and distant future will not suffer from the problems of the past. The allocation of frequencies was done in as equitable a way as possible. The goal was to supply a pool of frequencies for each county and a pool for state agency use with adequate reserve allocations for future needs in all areas, and a method to appeal initial allocations based on need.

1.2 Purpose, (continued)

The National Plan, as developed by NPSPAC, was followed very closely in all considerations for frequency allocation, re-use, turn back, regional interoperability, spectrum requirements and adjacent region operations.

This plan should provide the flexibility to accommodate the growth and changes which are bound to occur in public safety and public service communications operations long into the future.

2.0 AUTHORITY

2.1 Regional Planning Committee

The development of the Public-Safety Radio Communications Plan for Region 53, one of several regions in the State of Texas has followed the requirements of the FCC's Report and Order as issued in the matter of General Docket 87-112.

In accordance with the FCC's Report and Order 87-112, the Associated Public-Safety Communications Officers Inc. (APCO) recommended to the Commission the appointment of a "Convener" for Texas, Region 53. The Convener served as the coordinator for the assembly and formation of the planning committee.

Key participants in the formation of the Regional Planning Committee represent interested parties from both the Public Safety and Special Emergency Radio Services. A total of 8 individuals were primary participants in the development process. The list herein contains the names, organizational affiliations, mailing addresses and phone numbers of all participants in the Regional Planning Committee.

1. Don Brooks, Radio Services Manager
City of San Antonio
P.O. Box 839966
San Antonio, Texas 78283-3966
phone (512)299-7022
2. William Davenport, Fire Department
City of San Antonio
Fire Department Communications
P.O. Box 839966
San Antonio, Texas 78283-3966
phone (512)299-7968

3. **Nolan Suarez, Community Services Manager**
Alamo Area Council of Government
118 Broadway, Ste. 400
San Antonio, Texas 78218
phone (512)225-5201
4. **Al Notzon, Executive Director**
Alamo Area Council of Government
118 Broadway, Ste. 400
San Antonio, Texas 78218
phone (512)225-5201
5. **Victor Perez, Deputy Director**
Bexar County Information Services
203 W. Nueva
San Antonio, Texas 78207-4507
phone (512)978-0211
6. **Gene Kilgore, Director of Communications**
Coastal Bend Council of Governments
P.O. Box 9909
Corpus Christi, Texas 78469
phone (512)883-5743
7. **Jay Loretta Nelson**
Coastal Bend 911 Network Director
P.O. Box 9909
Corpus Christi, Texas 78469
phone (512)883-5743
8. **Ken Yoder, Frequency Coordinator**
Department of Public Safety
Austin, Texas 78773-0001
phone (512)465-2104
9. **Bob Haider, Governmental Sales**
Motorola, Communications and Electronics
7800 IH 10 West, Ste. 105
San Antonio, Texas 78230
phone (512)680-1850

10. **Barbara Cross, Government Acct. Representative**
GE Mobile Communications
16607 Blanco Road, Bldg. 6, #604
San Antonio, Texas 78232
phone (512)492-8281

The committee was selected by attendance at the planning meetings. Each member of the Committee representing an eligible licensee under the Public Safety Radio Services and the Special Emergency Radio Services was entitled to one vote in all Committee matters. Except as may be provided elsewhere in the Plan, the majority of those present at a scheduled meeting constituted a majority for all business. Only the final approval of the plan prior to submission to the FCC required a vote from more than would be in attendance at a regular meeting. In this case the vote was conducted by mail ballot sent to all those who had participated in the planning process. This way, the finished plan was reviewed and accepted by the widest, within reason, group of public safety/public service users.

2.2 Planning Committee Formation

The process of forming the Planning Committee was conducted in the following steps:

1. Personal interviews were held with the representatives of all major state agency radio users.
2. Presentations concerning the requirements for a regional planning committee were presented and discussed at state organization meetings. At each presentation there was an opportunity for persons to place themselves and/or their agency on the mailing list.
3. Letters of announcement were mailed to each major state agency radio users, those placed on the mailing list, as well as to state organizations composed of local government level public safety/public service users. Letters were also sent to all members of the Texas Chapter of APCO.
4. A public notice was placed in a newspaper with state wide distribution, for the first planning committee meeting. This first meeting was held at the Alamo Area Council of Governments, a public facility. (See Appendix A).
5. No organizational meetings were held before the chairperson was elected.

2.2 Planning Committee Formation, (continued)

6. Committee membership was left open to any person or agency which may not have been notified or decided to join the committee later.
7. Vendor participation was encouraged. Vendors were not allowed a vote.

2.3 National Interrelationships

The Regional Plan is in conformity with the National Plan. If there is a conflict between the two plans, the National Plan will govern. It is expected that Regional Plans for other areas of the country may differ from this plan due to the broad differences in circumstance, geography, and population density. By officially sanctioning this plan the Federal Communications Commission agrees to its conformity to the National Plan. Nothing in the Plan is to interfere with the proper functions and duties of the organizations appointed by the FCC for frequency coordination in the Private Land Mobile Radio Services, but it provides procedures that are the consensus of the Public Safety Radio Services and Special Emergency Radio Service user agencies in this Region. If there is a perceived conflict then the judgment of the FCC will prevail.

2.4 Federal Interoperability

Interoperability between the Federal, State, and Local Governments during both daily and disaster operations will primarily take place on the five common channels identified in the National Plan. Additionally, through the use of S-160 or equivalent agreements, a licensee may permit Federal use of a non-Federal communications system. Such use, on other than the five identified common channels, is to be in full compliance with FCC requirements for government use of non-government frequencies (Title 47 CFR, sec 2.103). It is permissible for a non-Federal government licensee to increase channel requirements to account for a 2 percent increase in mobile units, dependent on the amount of Federal Government Agencies involvement in its area, provided that written documentation from Federal agencies supports at least that number of increased units.

2.5 Regional Review Committee

Upon approval of this Plan by the Federal Communications Commission, a Region Review Committee will be established for the review of applications which do not fall within the stated guidelines provided for in this plan, or for the settlement of disputes concerning this plan and/or its application.

This committee shall consist of the Region 53 Chairman and representatives from each of the following agencies, State, Municipal Police, Fire, Sheriff, Emergency Medical Service, and a representation from other eligibles will also be welcome. This committee and its composition will be assured by the Texas APCO chapter and other Public Safety organizations. Membership on this committee will be solicited on an annual basis. Since this committee will probably not have regular business, it will be up to the Region 53 Chairman to notify the committee of problems, conflicts, or when it becomes apparent that spectrum demands will outpace available spectrum. Each member of the committee shall be furnished a copy of this plan upon their appointment or election to the committee.

Plan updates shall be accomplished by this committee. All changes or updates to the plan shall be first agreed upon by this committee and then submitted to the FCC for their review and consideration. When approved all changes shall be added to the plan with the appropriate documentation of approval.

This committee shall meet at least once annually to review the implementation of the plan. This review shall consist of examination of any and all license activity.

3.0 SPECTRUM UTILIZATION

This portion of the Plan provides a basis for proper spectrum utilization. Its purpose is to guide the Regional Review Committee in their task of evaluating the implementation of this plan within this Region.

3.1 Region Defined

Region 53 is within the State of Texas. This region is the result of definition by the Federal Communications Commission, as a result of recommendations made in the National Public Safety Planning Advisory Committee (NPSPAC) plan as submitted and approved and contained in Docket 87-112.

The purpose of this section is to provide the basis for the assignment of frequencies, and their re-use. Since the frequency allocation formula used is based on population within a county, it is necessary to provide this information within this plan. Below is the data used in the determination of frequency allocations.

3.2.1 Region 53 Population And Expected Growth Percentage.

The population of Region 53 divided between urban and rural residence. The urban population is 1,663,539 and the rural population is 1,475,214. The population within developed urban areas is about 53 percent.

Expected growth rate for Region 53 will be less than 1 percent annually.

3.2.2 Geographical Description

There are 47 counties in Region 53 with a total land mass of 56,023 square miles. The largest county is Webb, with a total of 3,376 square miles. Water areas of significance, are the Gulf of Mexico and the Rio Grande river.

As is shown above, the population of Region 53 is 3,138,753 distributed across the land area contained in the state of Texas. This presents some problems in area coverage for radio systems in that the entire land area of any given jurisdiction must be covered. The population per square mile is somewhat sparse which generally indicates that the concentration of radio users for public safety activities is also sparse. All of these items were taken under consideration in the allocation plan.

3.3 Usage Guidelines

All systems operating within Region 53 having five or more channels will be required to be trunked. Those systems having four or less channels may be conventional or trunked.

The FCC, in its Report and Order states, "Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions will not be granted routinely, however, and strong evidence showing why trunking is unacceptable must be presented in support of any request for exception."

3.3 Usage Guideline, (continued)

Systems of four or less channels operating in the conventional mode who do not meet FCC loading standards will be required to share the frequency on a non-exclusive basis.

Public Safety communications at the state level, as it impacts Region 53, will be reviewed by the Committee. State-wide public safety agencies will submit their communications plans for impact approval if they utilize communications systems within the Region 53 and those portions of such systems must be compatible with the Regional 53 Plan.

The next level of communication coverage will be a county/multiple municipality area. Those systems that are designed to provide area communication coverage must demonstrate their need to require such wide area coverage.

This would apply in a situation such as a city requesting coverage of an entire county. Communication coverage beyond the bounds of a jurisdictional area of concern cannot be tolerated unless it is critical to the protection of life and property. If the 800 MHz trunked radio technology is utilized, the system design must include as many county/multiple municipality government public safety and public service radio users as can be managed technically.

The county/multiple municipality agency(ies), depending upon systems loading and the need for multiple systems within an area, must provide intercommunications between area-wide systems. In a multi-agency environment, a lead agency using the 800 MHz spectrum, which may be any agency having primary response obligations in the geographic area, must implement the Common Channels in this band as mandated by the National Plan. Such implementation must be reviewed and approved by the Local APCO Frequency Advisor, and at his/her discretion, the Regional Review Committee.

Municipal terminology often differs. In order to provide a title for the next level of communications the term "CITY" is used to define the level below county-wide. CITY communications for public safety and public services purposes must provide only the communications needed within its boundaries. However, if the total number of radios in service does not reach minimum loading criteria for a trunked system, that municipality must consider utilizing the next higher system level, if 800 MHz trunked radio is available in the area. As those higher level systems reach capacity, the smaller system communicators in public safety and public service must then consider uniting

3.3 Usage Guideline, (continued)

their communications efforts to formulate one large system or forfeit use of the limited 800 MHz spectrum.

Where smaller conventional 800 MHz needs are requested, those frequencies to be utilized must not interfere with the region's trunked systems. The 800 MHz trunked radio system is to be considered the higher technology at this time and in greater compliance with FCC guidelines. The amount of interference that can be tolerated depends on the service affected. Personal life and property protection shall receive the highest priority and disruptive interference with communications involved in these services in an area shall not be tolerated. Any co-channel interference within an authorized area of coverage will be examined on a case by case basis by the Regional Review Committee.

3.4 Technical Design Requirements For Licensing

3.4.1 Definition of Coverage Area or Area of Jurisdiction

The coverage area shall be that area for which a system is intended to cover with a received signal strength of greater than 40 dBu. This area shall normally represent the boundaries of the County or the incorporated municipality which is applying for license. In the case of regional or area-wide, multi-jurisdictional systems, the coverage shall be that area of all jurisdictions participating in the system combined.

3.4.2 System Coverage Limitations

System coverage shall be limited to the coverage area defined as listed above plus no more than five (5) additional miles in all directions extending from said boundaries of definition. This limitation shall assure maximum frequency reuse. The only exception to this rule shall be those applicants wishing to offer service or system use to areas outside of their jurisdictional boundaries. In these situations the applicant shall provide a proposal of said service to the Region 53 Chairman. The Region 53 Chairman may request Regional Review committee consider the application.

Systems not located within the geographical center of the jurisdiction(s) for which they cover shall utilize either directional antenna or antenna/tower relationship techniques to achieve the coverage required by this plan.

3.4.3 Determination Of Coverage

There are four variables used in determining the area of coverage of a proposed system. These variables are (1) the required strength of the received signal, (2) antenna height above average terrain (HAAT), (3) the effective radiated power (ERP) of the system, and (4) the type of environment.

Received Signal Strength:

For purposes of this plan, received signal strength shall be the determining factor which defines the actual boundary of a system. The minimum signal level which marks the outer boundary of a system shall be 40 dBu.

Antenna Height:

Shall be the height of the antenna above the average terrain surrounding the tower site.

Effective Radiated Power (ERP):

The ERP is the transmitter output power times the net gain of the antenna system. The actual formula is: $ERP (w) = Power(w) \times \text{Antilog}(\text{net gain in dB} / 10)$.

Environment Type:

OKUMURA/HATA METHOD - The Okumura method uses four different classifications to describe the average terrain around a transmitter site or area. The classifications are:

1-URBAN; Which is built-up city-crowded with large buildings or closely interspersed with houses and thickly-grown trees. This would include the downtown area of a major city.

2-SUBURBAN; Which is a city of highway scattered with trees, houses and buildings. This would include the downtown area of a large city.

3-QUASI-OPEN; Is an area between suburban and open areas. This includes areas outside of city limits that have few buildings and houses.

3.4.3 Determination Of Coverage (continued)

4-OPEN; Is and area where there are no obstacles such as tall trees or buildings in the propagation path or a plot of land which is cleared of anything for 300 to 400 meters ahead. This would include farm land, open fields, etc.

The Okumura/Hata method is the method resident in the computer packing program to develop this plan. A minimum system shall be permitted without special consideration when it is limited to an HAAT of 100 feet and the transmitter is centrally located within the jurisdiction or jurisdictions participating in a system. In all jurisdictions, regardless of size, a maximum boundary radius of 8 miles shall be allowed provided adequate measures have been taken to assure that interference of existing co-channel and adjacent channel systems will not occur. Preparation of these requirements shall be the responsibility of the applicant. The Federal Communications Commission provides, in part 90.309(a)(4) of the Rules and Regulations, some additional guidance for these calculations.

3.4.4 Annexations And Other Expansions

As cities grow, annexations occur. When an expansion of the present city limits of any city currently using an 800 megahertz system within the spectrum as herein specified occurs, it is understood that the existing system may have to be expanded and its range increased. This is a modification and may be permitted. The increased range of the system will have to be determined at the time of modification to assure non-interference with any other existing system. Where interference is likely, the use of alternate methods of expansion, such as satellite systems may be necessary.

Should the annexation or expansion of a city effectively take in all or most of a county, the allocation for that county may be given to the city if required by said city and not in use or planned to be used by the county. Where more spectrum is not available from the initial allocation, the rules for expansion of initial allocation, as contained in this plan, shall apply.

3.4.5 Coverage Area Description

All applicants shall provide with their applications, a map showing the jurisdictional boundaries to be covered by the system, and the calculated system coverage. This map shall display the location of the system transmitter(s), including control stations. It is recommended that a U.S. Geological Survey (USGS) Quad topographical map be used for this purpose. If not available, a high quality locally produced map or a highway map may be substituted. Regardless of the type map used, the name of the applicant and the scale of the map shall be displayed on the map.

3.4.6 Give Back Frequencies

All agencies participating in the use of the new 800 megahertz spectrum shall prepare and submit a plan for the abandonment of their currently licensed frequencies in the lower bands. The Region 53 Planning Committee has the freedom to consider below-800 MHz public safety bands in developing their regional plans, but the licensing of channels in these bands will continue to be conducted through existing frequency coordination procedures.

Frequencies which are to be abandoned by an agency shall not be handed down to another agency within the respective jurisdiction. It is recommended that any jurisdiction wishing to "hand down" frequencies to another agency submit the proper coordination and application forms with the document of release.

The time frame allowed for phasing into 800 MHz and out of the lower currently licensed bands will be considered on a case by case basis by the review committee. Generally, one year will be considered acceptable in most cases, with two years as a maximum. Any agency requiring more than two years shall provide documents stating the reasons for the delay, and give the estimated time of turn-back.

3.4.7 Unused Spectrum

Due to the fact that all of the frequency spectrum is not needed at this time, the excess channel pairs will be returned to a reserve pool. These channels may be used for conflict with adjacent Region allocations or may simply remain within this Region until needed. This does not imply that these frequencies are unavailable, only that before they can be utilized within the Region they must be coordinated via the regular APCO coordination process and within the guidelines set forth in this plan. Where possible, the channels designated for a jurisdiction in this plan shall be used.

3.4.8 Adjacent Region Coordination

Coordination with adjacent regions shall be an on-going process until all region plans have been finalized. At present, all adjacent regions have been coordinated with and no conflicts have been identified. The adjacent regions with which coordination has been conducted are: Region 49; Region 50; and Region 51.

(SEE APPENDIX B)

As the use of the five National channels is not considered a day-to-day function, the "hard" coordination for the use of these channels is not considered to be necessary or advisable. The use of these channels will always be on a non-interference basis, with on-the-air coordination at the time of use when required. Any user found to be operating in any manner other than this shall be considered to be operating improperly and subject to the existing Federal Communications Commission rules for willful interference with the communications of other users.

3.5 Initial Spectrum Allocation

3.5.1 Frequency Sorting Methodology

The initial spectrum allocation for the Region was determined by a computerized frequency sorting process performed by APCO/CET. The purpose of the computer program which assigns frequencies to specific eligibles and to pools for future assignments is two-fold:

- A) The assignments must result in a high degree of spectrum efficiency, and
- B) The assignments must result in a low probability of co-channel and adjacent channel interference.

Since the desired output is a geographic sorting of frequencies, a method of defining geography must be part of the input. A list of the number of channels to be assigned in each geographic area is also required, along with the name of the eligible or pool.

Acceptable interference probabilities are determined for the Region. Frequency assignments are then made using a computer program which satisfies the goals of spectrum efficiency and interference protection. The following narrative describes the factors and process used by the computer program.

3.5.2 Geographic Area

For the purpose of this frequency sort, a geographic area is defined as one or more circles of equal radius. To the degree practical, the circle(s) should include the entire area of the eligible's geopolitical boundary, but not exceed the boundary by more than three (3) miles. Thus, the procedure is to gather maps of sufficient detail, outline the areas to be defined, determine the coordinates and radius of the circles which define each area, and tabulate the data.

3.5.3 Define The Environment

The environment of each system is defined according to the Okumura/Hata method of classifications.

3.5.4 Blocked Channels

In the Region there are five mutual aid channels which must be blocked out to prevent the computer from making assignments on these channels. (Since the mutual aid channels are spaced at 0.5 MHz intervals, other Region-wide systems are spaced at 0.5 MHz and placed adjacent to the mutual aid channels. This procedure reduces the impact of blocked adjacent channels by virtue of the fact that the channel plan already has protection spacing on each side of the mutual aid channels.)

These Region-wide blocked channels are identified by FCC channel number, tabulated and they become input to the computer program.

3.5.5 Transmitter Combining

The computer program is designed to provide a minimum frequency separation between any two channels assigned to the same eligible at the same site. This separation is provided in order to enable more efficient combining of multiple transmitters to a single antenna. These separated blocks of frequencies also have a maximum size. That is, if the eligible has more frequencies than the maximum size of the combining block, then a second compatible block is created, and so on. Each of these parameters is adjustable in the program on a global basis. The default parameters chosen are 0.25MHz minimum spacing and five channel blocks.

3.5.6 Special Considerations

There are licensees in the 806-821/852-866 MHz spectrum who plan to expand existing systems into the 821-824/866-869 MHz bands. Some of the existing radio units are unable to operate on 12.5 KHz separated carrier frequencies. The result is that these radios can only operate on "even" FCC numbered channels in the 821-824/866-869 MHz band. The computer program is able to take this into account when making assignments.

3.5.7 Protection Ratios

There are two interference protection ratios built into the computer program. One is for the co-channel case, the other is for the adjacent channel case. The ratios provide 35 dB Desired/Undesired signal ratio for co-channel assignments, and 15 dB Desired/Undesired ratio for the adjacent channel case. These ratios provide an acceptable probability of interference for Public Safety Services.

3.5.8 Adjacent Region Considerations

The computer program requires a listing of channels to be blocked along the borderline with other regions which have pre-existing plans. If the adjacent region plan was developed using the APCO/CET packing program, this information exists in the database. If the adjacent region plan was developed by another method, then the data must be obtained from the adjacent region's plan in order to build the exclusion list.

4.0 COMMUNICATIONS REQUIREMENTS

4.1 Common Channel Implementation

The implementation of the International Common Channels must follow the guidelines as set forth by the Federal Communications Commission by the approval of the National Plan. These five common channels are accessible by all levels of government and shall be used in accordance with the provisions of the National Plan. All mobile and portable equipment must be equipped to operate in the "talkaround mode" when required on the International Channels.

The International calling channel (821/866.0125 MHz) shall be implemented as a full mobile relay. Wide area coverage transmitters will be installed where applicable within a system. Large system users (5 channels or more) of 800 MHz shall be required to monitor this channel at all times. The area of

4.1 Common Channel Implementation, (continued)

coverage for this channel shall be equal to the area covered by the licensed system. This may or may not require the use of satellite receivers within the area to meet this requirement.

The four International Tactical (ITAC) Channels will be assigned State-wide, for use as needed by all eligible licensees. These channels are to be used in accordance with the National Plan and in compliance with the regulations as set forth by the Federal Communications Commission. These channels require no special licensing, only that the users be eligible for licensing on the other Public Safety 800 MHz channels as specified in section 90.616 (a) of the FCC Rules and Regulations.

4.1.1 Areas of Operation

The common channels shall be available for use throughout the Region. No specific assignments were deemed necessary within the Region.

4.1.2 Operation on the Common Channels

Normally, the five interoperable channels are to be used only for activities requiring inter-communications between agencies not sharing any other compatible communications system. Interoperable channels are not to be used by any level agency for routine, daily operations. In major emergency situations, one or more ITAC channels may be assigned by the primary Public Safety Agency within that area of operation. The primary Public Safety agency in each county, if not defined elsewhere in the plan, shall be the County Sheriff's Department or Public Safety Department or the lead agency, which may be any agency licensed to operate in this spectrum, or "on-scene" commander. The primary Public Safety agency shall be the city level Public Safety Department in situations which occur within the corporate limits of said city. These primary agencies will assign one or more of the ITAC channels for use according to need during each special situation requiring the use of these channels.

Participants in the interoperable channels include Federal, State, and Local Disaster Management agencies. Police, Fire, and providers of Basic and Advanced Life support services will be the primary using agencies. If radio channels are available, other services provided in the Public Safety Radio Services and the Special Emergency Radio Services may also participate to the extent required to insure the safety of the public. These agencies include the Highway Department, Motor Vehicle Comptroller, Wildlife and other special service agencies not normally involved in day-to-day public safety

operations.

4.1.3 Operation Procedures

On all Common Channels, plain English will be used at all times, the use of unfamiliar terms, phrases, or codes will not be allowed.

4.1.3(I) International Calling Channel (ICALL): The ICALL channel shall be used to establish contact with other users in a particular Region that can render assistance at an incident. This channel shall not be utilized as an ongoing working channel. Once contact has been established between agencies, an agreed upon ITAC or mutual aid channel shall be used for continued communications.

4.1.3(II) International Tactical Channels (ITAC-1 - ITAC-4): These frequencies are reserved for use by those agencies involved in interagency communications. Incidents requiring multi-agency participation will utilize these frequencies as directed by the control agency assuming responsibility for an incident or area of concern. These frequencies may be subdivided according to function in an incident or by geographical location in response to an incident. It is recommended that the following assignments for ITAC-1 through ITAC-4 be used when possible.

ITAC-1	Law Enforcement
ITAC-2	Fire Services
ITAC-2	Emergency Medical Services
ITAC-4	Command and Control

4.1.4 Coded Squelch

All equipment capable of operating on the five (5) common channels shall be equipped with the National Common Tone Squelch of 156.7 Hz. Mobile relays on these channels, if authorized, may use additional tone or digital squelch codes for the purpose of selecting individual mobile relay stations, provided the National Common Tone Squelch Code is used on the output. If such an arrangement is utilized, provision must also be made for certain centralized, high level sites to be activated by the 156.7 tone to ensure emergency access by transient units.

4.2 Network Operating Methods

Communications systems on ITAC-1 through ITAC-4 will be implemented by agencies who volunteer on a distributed coordinated basis. Every primary geographic section of the Region is intended to be covered by at least one of the ITAC channels. In many areas the common channels will be utilized on a mobile to mobile talk-around basis. Mobile relays on ITAC-1 through ITAC-4 will be on a limited coverage design to permit reuse of the channel several times within the Region and in adjacent regions. Since Region 53 will probably not have a large number of stationary ITAC Channel stations, the implementation of mobile relay or repeaters is strongly encouraged. This will fill an "on-scene" requirement for most multi-agency response situations. Adjacent region coordination will be via existing mutual aid coordination procedures with the requesting region establishing the tactical frequency assignment.

4.3 Requirements For Trunking

All systems operating in the Region having five or more channels will be required to be trunked. Those systems having four or less channels may be conventional. It is strongly suggested that any entity licensing three or more repeaters use trunking.

The FCC in its Report and Order states: "Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions will not be granted routinely. Strong showings as to why trunking is unacceptable must be presented in support of any request for exception."

Systems that do not meet FCC loading standards can be required to share such frequencies on a non-exclusive basis. Those agencies requesting Data channels only can be required to share channels with adjacent agencies wherever feasible or limit coverage to their geographic area. Exceptions will be considered on a case-by-case basis by the Regional Review Committee.

Depending on systems loading and the need for multiple systems within an area, operators of wide area systems (including, but not limited to, designated "Monitoring Agencies") must provide for coordination between area-wide systems and "Monitoring Agencies". Single municipalities or agencies must restrict design and implementation of their systems(s) to provide only the communications needed within its geopolitical boundaries. The use of trunked systems is encouraged. However, if the total number of radios in service does not reach minimum loading criteria for a trunked system, that