



PR 92-189

**DEPARTMENT OF ADMINISTRATIVE SERVICES**

**ORIGINAL  
FILE**

**TELECOMMUNICATIONS DIVISION**

200 Piedmont Avenue, Suite 1402, West Tower

Atlanta, Georgia 30334-5540

**DAVID C. EVANS**  
COMMISSIONER

**GEORGE A. CHRISTENBERRY, JR.**  
DIRECTOR

April 2, 1992

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**AUG 12 1992**

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

Ms. Donna Searcy  
Secretary  
Federal Communications Commission  
Washington, DC 20554

Dear Ms. Searcy:

As chairperson of the Region 10 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 Georgia formulated in accordance with FCC Dockets 87-112 and 87-359.

The Region 10 convener mailed notices that an initial Region 10 Public Safety Planning meeting would be held on November, 1988, at the Georgia Public Safety Training Facility, Forsyth, Ga. These were sent to all eligible radio licensees in the State of Georgia. This initial regional planning meeting officially established the Region 10 Planning Committee and its Subregions and I was elected Chairperson by the quorum. Participants in that meeting represented Public Safety Radio Services, Special Emergency Radio Service and the vendor community. Please note that the vendors were encouraged to participate, but they were not allowed to vote.

As Chairperson of the Region 10, I compiled all the survey forms submitted by over 450 agencies through their sub-regional chairpersons and developed the final draft. On Jan. 14, 1992, I mailed the final draft to all Sub-regional chairpersons for final approval. Also a public notice was placed in the largest circulated newspaper in the State.

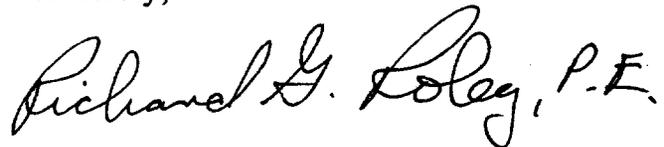
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from Bureau

Ms. Donna Searcy  
Page Two

This final document is outstanding proof that a diverse group of individuals and organizations ranging from Police, Fire, Federal Government, State Government, Local Government, Emergency Management can work together effectively for the good of the community and citizens they serve. I would like to specially thank the Region 10 Sub-regional chairpersons for their tireless efforts.

Please call me at 404-651-9094 if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Richard G. Roley, P.E." The signature is written in a cursive style with a large, prominent 'R' and 'G'.

Richard G. Roley, P. E.  
Region 10 Chairman  
DOAS - Telecommunications  
200 Piedmont Ave., Suite 1402 West  
Atlanta, Georgia 30334-5540

RGR/II

xc: Alireza Shahnami

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

**REGION 10, GEORGIA**  
**NATIONAL PUBLIC SAFETY AND**  
**SPECIAL EMERGENCY**  
**COMMUNICATIONS PLAN**

Submitted by:

*Richard G. Roley, P.E.*

Richard G. Roley, P.E.  
Chairman Region 10, Georgia  
200 Piedmont Ave., Suite 1402 West  
Atlanta, Georgia 30334-5540

JANUARY 15, 1992

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**APPENDIX C      DEMOGRAPHIC INFORMATION**

**APPENDIX D      FIELD STRENGTH TABLE**

**APPENDIX E      LETTERS OF CONCURRENCE**

**APPENDIX F      PUBLIC NOTICE**

**APPENDIX G      REGIONAL REVIEW COMMITTEE ORGANIZATION  
AND OPERATING PROCEDURES**

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.

### **3.5 REASSIGNMENT OF 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 Regional Review Committee would have the freedom to consider below-800 MHz public safety bands in developing their regional plans, but the licensing of channels in these bands would be conducted through existing frequency coordination procedures.

Frequencies which are to be abandoned by an agency shall not be handed down to another 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 general maximum. Any agency requiring more than one year shall provide documents stating the reasons for the delay, and give the estimated time of completion.

### **3.6 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: Alabama (Region 1); Florida (Region 9); North Carolina (Region 31); Tennessee (Region 39); and South Carolina (Region 37).

## **1.0 SCOPE**

### **1.1 INTRODUCTION**

In December 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 satisfied. By Notice of Inquiry, the FCC solicited comments from the Public Safety Community and other interested parties concerning present and future public safety and special emergency radio communications needs. This resulted in the recognition of public safety and special emergency agency needs for additional radio channels. Subsequently, the FCC allocated an additional 6 megahertz of spectrum for public safety and special emergency use nationwide. The FCC also recognized the necessity of developing a National Plan to promote inter-operability among public safety providers and to insure an efficient use of the newly allocated spectrum. The National Public Safety Planning Advisory Committee (NPSPAC) was established in December 1986, to perform this function.

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.

This document is the regional plan for Region 10 (State of Georgia) developed according to FCC 87-359, which will become part of the National Plan when accepted by the FCC.

## 1.2

### **PURPOSE**

The purpose of this regional plan is to define, under the umbrella of the National Plan, specific users and their spectrum requirements, regional inter-operability requirements, technical and frequency reuse requirements, and other requirements that may apply to Region 10 and adjacent regions. This plan provides flexibility to accommodate a wide variety of specific communications requirements that are needed for this region's public safety and special emergency service providers.

This Regional Plan was developed with the objective of assuring that unassigned frequencies(821-824/866-869 MHz)would be allocated in an equitable fashion to those public safety and special emergency radio service eligibles with the highest demonstrated need. Further the Regional Plan provides for these frequencies to be allocated and used in the most efficient manner possible. Also, the plan provides a pool of frequencies for each county and a pool of frequencies for state agency use in all areas. The Plan provides a method to appeal initial allocations based on need.

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 that are bound to occur in public safety and public service communications operations long into the future.

## 2.0

### **AUTHORITY**

## 2.1

### **REGIONAL PLANNING COMMITTEE**

Authority for the Regional Planning Committee to carry out its assigned tasks is derived from the Federal Communications Commission, Report and Order, Docket 87-112. 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 147 individuals participated in the initial convenor's meeting to select a Regional Committee Chairperson, determine sub-regions and elect sub-regional chairpersons. All attendees were provided a ballot, except vendors, to vote for the Regional Committee Chairperson. The sub-regions for the Georgia region are shown in Figure I. The Regional Committee Chairperson and Sub-regional Chairpersons are listed in Appendix A.

To assist the regional planning committee, more than 1100 radio communications survey forms were mailed to public-safety and special emergency radio users. Also, sub-regional information meetings were held to advise users about the plan and request their assistance to develop the plan. Appendix B is a copy of the survey form. To assist the sub-regional chairpersons gather the information within their sub-region, meetings were held in the sub-regions to discuss the planning process and the importance of submitting the survey forms.

## **2.2**

### **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 Service, but rather it provides procedures that are the consensus of the Public Safety Radio Service and Special Emergency Radio Service user agencies in this Region. If there is a perceived conflict, then the judgment of the FCC will prevail.

### 2.3

#### **FEDERAL INTEROPERABILITY**

For systems within the 821-824/866-869 MHz band, 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, using 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 up to a two percent increase in mobile units, if written documentation from Federal agencies supports at least that number of increased units.

### 2.4

#### **REGIONAL REVIEW COMMITTEE**

Upon approval of this Plan by the Federal Communications Commission, a Regional Review Committee will be established for the review of applications that 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.

The membership of the Regional Review Committee shall consist of the Region Chairperson, each of the nine Sub-region Chairpersons, and as contributing but non-voting members, the Georgia APCO local frequency advisors. This committee and its composition will be assured by the Georgia APCO chapter and other Public Safety organizations. Regional Review Committee organization and operating procedures are outlined in Appendix G. 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 Local APCO Frequency Advisor 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 his or her 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 the examination of all license activity.

### **3.0 SPECTRUM UTILIZATION**

This portion of the Plan provides a basis for proper spectrum utilization of the 821-824/866-869 MHz frequency band. Its purpose is to guide the APCO Frequency Coordinator and/or the Review Committee in their task of evaluating the implementation of this plan within this Region.

### **3.1 REGION DEFINED**

Region 10 is the State of Georgia. 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 approved and contained in Docket 87-112. For this plan, the State of Georgia shall be defined as all the lands and waters contained within the boundaries of the State of Georgia.

### **3.2 REGION PROFILE (Demographic Information)**

This section provides the basis for the assignment of frequencies, and their re-use. Since the ~~frequency allocation formula used is based on population within a county~~, Appendix C contains the data used in the calculations for the frequency allocations.

### 3.3 GEOGRAPHICAL DESCRIPTION

There are 159 counties in the state with a total land mass of 58,910 square miles. The area for the counties range from 122 square miles to 907 square miles.

Water areas of significance include Lake Lanier, Lake Altoona, Hartwell Lake, Lake Oconee, Lake Sinclair, West Point Lake and Russell Lake. The total water areas for the state is 853 square miles.

The terrain in the state varies from marsh land along the coast, rolling hills in the central and southern portions, and mountains to the north. The six major metropolitan areas in the state are: Atlanta, Augusta, Savannah, Macon, Albany and Columbus.

### 3.4 USAGE GUIDELINES

All systems utilizing the 821-824/866-869 MHz channels operating within the Region having **five or more channels must be trunked**. Those systems having four or less channels may be conventional or trunked.

**The state has been divided into twenty-one zones to provide for Public Safety communications at the state level.** Statewide public safety agencies will submit their communications plans to the Regional Review Committee for approval if they utilize designated channels within these zones and those portions of such systems must be compatible with the Regional 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 jurisdictional area of coverage cannot be tolerated unless it is critical to the protection of life and property.

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

Municipal terminology often differs. To provide a title for the next level of communications the term "city" is used to define the level below countywide. City communications for public safety and public services purposes must provide only the communications needed within its boundaries. However, if the number of radios in service does not reach minimum loading criteria for a trunked system, that city 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 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 best technology 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

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 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.

#### **4.0 COMMUNICATIONS REQUIREMENTS**

##### **4.1 COMMON CHANNEL IMPLEMENTATION**

The implementation of the National common channels must follow the guidelines as stated 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 according to the provisions of the National Plan.

The 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 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 Channels will be assigned state-wide, for use as needed by all eligible licensees. These channels are to be used according to the National Plan and in compliance with the regulations as stated by the Federal Communications Commission. These channels require no special licensing, only

that the users be licensed on the other Public Safety 800 MHz channels as specified in section 90.616<sup>7</sup>(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 OF 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 or for interagency communications not requiring interoperability. In major emergency situations, one or more tactical channels may be assigned by the primary Public Safety Agency within that area of operation. The primary Public Safety agency in each county 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 that occur within the corporate limits of said city. These primary agencies will assign one or more of the International Tactical 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 Emergency 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 also may participate when required to insure the safety of the public. These agencies include the Department of Transportation, Public Service Commission, Forestry, Department of Human Resources 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, and the use of unfamiliar terms, phrases, or codes will not be allowed.

**4.1.3(1) CALLING CHANNEL (CALL)**

The calling 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 a working channel. Once contact has been established between agencies, an agreed upon Tactical or mutual aid channel shall be used for continued communications.

**4.1.3(2) 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-3 .....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 selecting individual mobile relay stations, provided the National Common Tone Squelch Code is used on the output. If such an arrangement is utilized, provision also must be made for certain centralized, high level sites to be activated by the 156.7 tone or digital squelch codes for selecting individual mobile relay stations, provided the National Common Tone Squelch Code is used on the output.

#### 4.2 **NETWORK OPERATING METHODS**

Communications systems on ITAC-1 thru 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 International Tactical channels. In many areas the common channels will be utilized on a mobile to mobile talk-around basis. Mobile relays on ITAC-1 thru 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 10 will probably not have many of stationary Tactical 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.

#### 4.3 **REQUIREMENTS FOR TRUNKING**

As stated in Para 3.4, all systems utilizing the 821-824/866-869 MHz channels in the Region having five or more channels must 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 may be required to share such frequencies on a non-exclusive basis. Those agencies requesting Data channels only may 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 system(s) to provide only the communications needed within its geopolitical boundaries. The use of trunked systems is encouraged. However, if the number of radios in service does not reach minimum loading criteria for a trunked system, that users should consider consolidating their communications system with other 800 MHz trunked radio systems in the area, if spectrally efficient. As systems reach capacity, the smaller system users must consider consolidating their communications systems to formulate one large trunked system.

A requesting applicant for radio communications in the 800 MHz public safety services in the Region must conform to the FCC loading criteria for its proposed system. The provisions of this regional plan must be used as a guide for establishing any new systems. Strict adherence for limiting the area of coverage to the boundaries of the applicant agency's jurisdiction must be observed. Overlap or extended coverage must be minimized even where systems utilizing 800 MHz trunked radio systems are proposing to intermix systems for cooperative and/or mutual aid purposes.

Antenna heights are to be limited to provide only the necessary coverage for a system. When antenna locations are restricted to only the "high-ground", transmitter outputs and special antenna patterns must be employed to produce only the necessary coverage with the proper amount of ERP. All necessary precautions are to be taken to gain maximum reuse of the limited 800 MHz spectrum.

#### 4.4

#### **CHANNEL LOADING REQUIREMENTS**

An agency/jurisdiction requesting a single frequency to replace a frequency currently in use that will be turned back for reassignment will not be required to meet loading requirements to obtain the new frequency. However, if the single frequency is not loaded to more than 50 units within three years after the license is granted, the frequency will be available for assignment to other agencies on a shared basis if other frequencies meeting the criteria for assignment are exhausted. Shared use of a frequency is not interference free. Users of single frequency systems may be required to provide the Regional Review Committee "confirmation of loading" for mobiles and portables to validate system loading.

This exception shall apply to agencies having only one system and a single frequency. Agencies/jurisdictions requesting multiple frequencies or employing trunking technology shall comply with the loading standards as outlined below or provide a "Traffic Loading Study" that meets the criteria as outlined below.

**4.4.1 LOADING TABLES**

<u>EMERGENCY</u>		<u>NON-EMERGENCY</u>	
<u>CHANNELS</u>	<u>UNITS/CHANNEL</u>	<u>CHANNELS</u>	<u>UNITS/CHANNEL</u>
1 - 5	70	1 - 5	80
6 - 10	70	6 - 10	90
11 - 15	80	11 - 15	105
16 - 20	85	16 - 20	120

Agencies requesting additional frequencies must show loading of 100 percent or greater on their existing system. Should a demand for frequencies exist after assignable frequencies become exhausted, any system having frequencies assigned under this plan four or more years previously and not loaded to at least 70 percent will lose operating authority on enough frequencies to bring the system into compliance with the 70 percent loading standard. Frequencies lost in this manner will be reallocated to other agencies to help satisfy the demand for additional frequencies.

**4.4.2 TRAFFIC LOADING STUDY**

Justification for adding frequencies, or retaining existing frequencies, can be provided by a traffic loading study in lieu of loading by number of transmitters per channel. It will be the responsibility of the requesting agency to provide a verifiable study showing sufficient airtime usage to merit additional frequencies. A showing of airtime usage, excluding telephone interconnect air time, during the peak busy hour greater than 70 percent per channel on three consecutive days will be required to satisfy loading criteria.

**4.4.3 SLOW GROWTH**

All systems in the 821-824/866-869 MHz bands under this will be slow growth in accordance with Section 90.629 of the Commissions' rules.

#### **4.5 USE OF LONG RANGE COMMUNICATIONS**

During incidents of major proportions, where public safety requirements might include the need for long-range communications in and out of a disaster area, alternate radio communications plans are to be addressed by lead agencies within the sub-region. These agencies should integrate the appropriate interface to the long distance communications providers. Such long distance radio communications might be amateur radio operations, satellite communications and/or long range emergency preparedness communications systems, any or all of which should be incorporated as part of the communications plans of those lead agencies. They then could provide the means to communicate outside the area for themselves and the smaller agencies who might need assistance. Instances as addressed in the National Public Safety Planning Advisory Committee's Plan, such as earthquakes, hurricanes, floods, widespread forest fires, or nuclear reactor problems could be a cause for such long-range communications needs.

#### **4.6 EXPANSION OF EXISTING SYSTEMS**

Existing systems that are to be expanded to include the frequency bands of 821 - 824/866 - 869 MHz will have their mobile radios "grandfathered", provided that they are modified in conformance with the Memorandum Opinion and Order, FCC Docket 87-112. Primarily this involves reducing the modulation to +/-4 KHz. Existing base stations in the frequency bands 806 - 821/851 - 866 MHz may not be used in the frequency bands 821 - 824/866 - 869 MHz.

#### **5.0 TECHNICAL DESIGN REQUIREMENTS FOR LICENSING**

**5.1 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 that 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.

**5.2 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 their jurisdictional boundaries. In these situations the applicant shall provide a proposal of said service to the Frequency Coordinator, who may request planning committee review, for consideration.

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

**5.3 DETERMINATION OF COVERAGE**

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

Received Signal Strength: For this plan, received signal strength shall be the determining factor that defines the actual boundary of a system. The minimum signal level that marks the outer boundary of a system shall be 40 dBu.

**Antenna Height:** This shall be the height of the antenna above the average terrain surrounding the tower site.

**Effective Radiated Power (ERP):** This shall be the transmitter output power minus all line and equipment losses multiplied by the gain of the transmitting antenna.

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.

**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.