

## **1 764-776/794-806 MHz Regional Plan for Region 49 (Central Texas)**

This document is the regional plan for Region 49 (Central Texas) describing how the 746- 776/796-806 MHz General Use frequencies will be allocated and implemented in the region.

### **1.1 Regional Chair**

The Regional Chairman of Region 49 is Ron Mayworm. His contact information is below:

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### **1.2 Other RPC Officers and RPC Membership**

The Secretary/Treasurer of Region 49 is Charles Brotherton. His contact information is below:

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Travis County Emergency Services  
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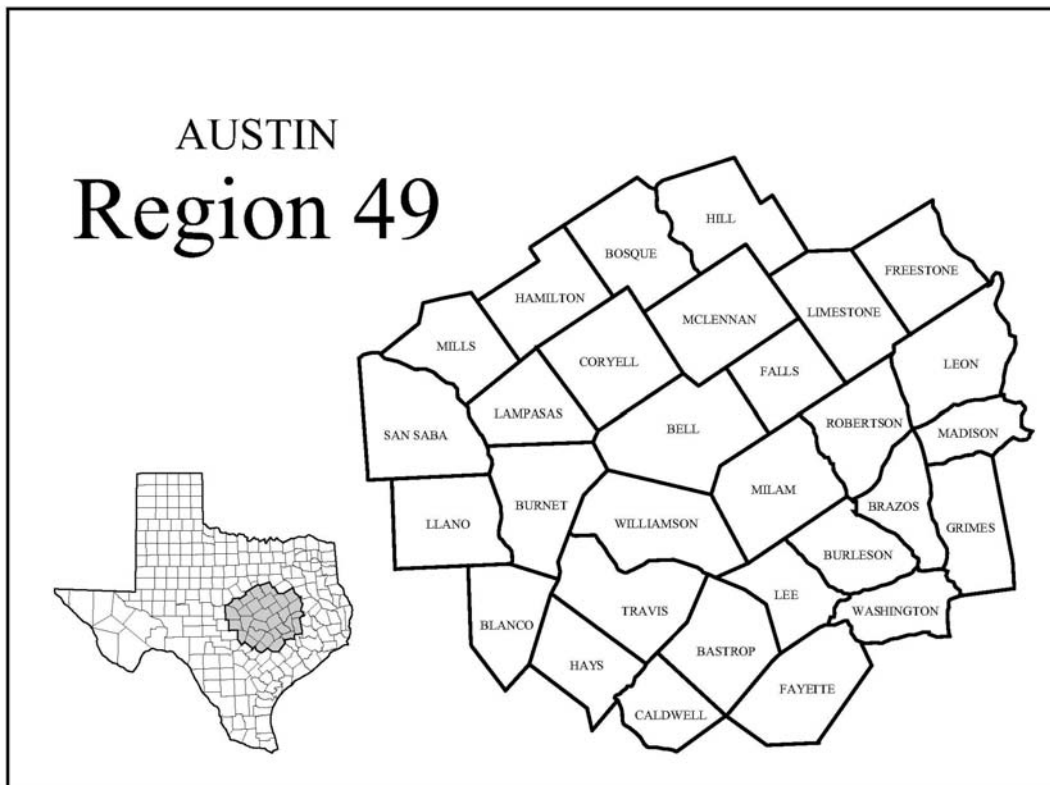
Membership in the Region 49 Regional Planning Committee is open to any interested party.

Committee officer requirements, voting procedures and membership attendance requirements are listed in the Region 49 Regional Planning Committee bylaws. **Appendix A** contains these bylaws. **Appendix B** includes a list of Region 49’s initial members and their agency/affiliation. Voting and operating procedures are described in Section 2.3 of this plan.

## 2 Regional Planning Committee

### 2.1 Description of Region

Region 49 is comprised of 30 counties in central Texas. The following figure shows the geographical relationship of the counties to each other and to the rest of the state.



The following table lists each of the 30 counties and indicates the following information for each county:

- county area in square miles
- the county’s estimated population in 2005
- the approximate minimum ground elevation (above sea level) in the county

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- the approximate maximum ground level elevation (above sea level) in the county
- the county's population density (persons per square mile) used by CAPRAD to develop the 700 MHz channel allocations (based on 2000 census figures)
- a general description of the county's topography

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COUNTY	AREA (SqMi)	POPULATION (2005 estimate)	~MIN. ELEV.	~MAX. ELEV.	POPULATION DENSITY (2000)	TOPOGRAPHIC CHARACTERIZATION
Bastrop	895	68,957	400	600	64.989	Rolling uplands & broken hills
Bell	1055	252,658	450	1200	224.563	Rolling prairies to rolling uplands, deeply cut with steep bluffs along the Balcones Escarpment
Blanco	714	9,317	800	1850	11.836	Hilly to mountainous
Bosque	989	18,041	480	1200	17.392	Rolling hills
Brazos	588	161,380	200	350	260.192	Rolling prairie
Burleson	668	17,529	225	475	24.747	Undulating to hilly; eastern part is a broad valley
Burnet	1000	38,547	700	1700	34.283	Rolling hills & prairies with local deep dissections
Caldwell	546	35,751	375	500	58.993	Low rolling to hilly
Coryell	1031	74,190	600	1493	71.288	Plateaus & grasslands
Falls	765	18,194	300	500	24.153	Broad flatlands to gently rolling
Fayette	950	23,077	200	600	22.951	Level to steep slopes
Freestone	888	18,775	600	900	20.363	Coastal plain upland
Grimes	799	24,754	193	415	29.677	Coastal plain boundary; gently rolling
Hamilton	844	8,191	900	1600	9.847	Rolling prairie with abruptly rising flat-topped buttes
Hays	694	122,884	600	1400	143.964	Hilly and plains divided by the Balcones Escarpment
Hill	1012	34,378	400	900	33.585	Level plains & gently rolling hills
Lampasas	714	20,743	850	1700	24.945	Rolling prairie with sloping hills
Lee	631	16,732	270	970	24.912	Level plain & gently rolling hills
Leon	1078	16,352	150	500	14.305	Rolling plains
Limestone	931	22,481	375	665	24.262	Level to rolling prairies
Llano	941	18,497	800	2000	18.233	“Hill Country” on the eastern part of the Edwards Plateau
Madison	473	13,181	213	364	27.553	Rolling prairie
McLennan	1031	219,344	400	850	204.934	Flat to rolling with locally steep slopes along the Balcones Escarpment
Milam	1019	25,453	250	600	23.840	Level to slightly rolling
Mills	734	5,100	1100	1700	6.885	Hills & plateaus
Robertson	854	16,162	250	500	18.723	Flat to gently rolling
San Saba	1136	6,138	1100	1800	5.453	Steep to rolling, with deep local dissections
Travis	989	882,077	400	1300	821.061	Divided by the Balcones Escarpment
Washington	611	31,834	200	500	49.855	Gently rolling hills
Williamson	1137	315,490	400	1300	222.635	Coastal plain and western plain divided by the Balcones Escarpment
<b>TOTALS</b>	<b>25,717</b>	<b>2,536,407</b>				

In general, the region includes portions of the high plains, central plains, and coastal plains of Texas. The western counties consist of the rolling hills and prairies of the high plains. The eastern counties consist of the gently rolling coastal plains and prairies.

The most significant geological feature of the region is the Balcones Escarpment, which runs through Hays, Travis, Williamson, Bell, and McLennan counties. The escarpment consists of steep cliffs and cliff-like structures. The area adjacent to the escarpment is popularly known as the Texas Hill Country, where the land is highly dissected by fast-moving streams through deep-sided canyons.

Population densities (based on 2000 census data) in the region range from a rural 5.453 persons/square mile to an urban 821.061 persons/square mile. There are seven cities with populations exceeding 50,000 in the region. The cities (and their counties) are: Austin (Travis & Williamson); Waco (McLennan); Killeen (Bell); College Station (Brazos); Bryan (Brazos); Round Rock (Williamson); and Temple (Bell).

The variety of terrain and population densities presents some unique problems in achieving full radio coverage of some jurisdictions' areas. All these factors were considered when designing flexibility into this plan.

In previous NPSPAC 821 MHz frequency allotments, spectrum amounts disproportionate to population densities were allotted. In the 700 MHz band, county allotments for the narrowband channels have been developed based on terrain characteristics and population densities both within the region relative to adjacent regions. Due to the region's diverse population densities and the scarce spectrum resources in the region's heavily populated areas, it is anticipated the majority of requests for voice/data spectrum will be from the metropolitan areas, several of which currently operate existing 800 MHz radio networks.

There are four Metropolitan Statistical Areas located in the Region. Their names, counties in which they are located, and their estimated 2005 populations (per the Texas State Demographer) are:

Austin/Round Rock	Travis & Williamson	1,425,159
Killeen/Temple/Fort Hood	Bell & Coryell	347,591
Waco	McLennan	219,344
Bryan/College Station	Brazos	195,071

It is anticipated that other areas within Region 49 may request 700 MHz channels from established county pool allotments to either expand existing 800 MHz systems or develop new 700 MHz systems.

## *2.2 Notification Process*

Ron Mayworm, chairman of the Region 49 821 MHz Regional Review Committee, was the 700 MHz Convener. The first 700 MHz Regional Planning Committee meeting date was October 29, 2001. Interested parties were given more than 60 days' notice prior to the first meeting. Announcements of the date, time, location, and purpose of the first meeting were sent to the FCC Wireless Telecommunications Bureau and published in the Association of Public Safety Communications Officials, Inc. magazine. More than 700 copies of the first meeting notice were mailed to all known public safety agencies within the region, utilizing mailing lists supplied by the area's Councils of Governments and the Texas State Commission on Fire Protection. Legal notices were published twice in each of the following newspapers published within the region: The Waco Tribune-Herald, the Austin American-Statesman, the Bryan/College Station Eagle, and the Temple Daily Telegram.

Based on information from the Bureau of Indian Affairs, there are no Native American tribal reservations located within Region 49. However, copies of the first meeting's notice were mailed to all known tribal headquarters addresses located in the state of Texas.

Copies of the notice issued by the FCC, the mailed notice of Region 49's meeting, the notice placed in the APCO Bulletin, and the ads placed in multiple newspapers are included in **Appendix D**.

At the first meeting all participants were asked by which methods they had received notice of the meeting. The great majority of participants had received the direct mail notices. None of the participants had seen any of the published newspaper notices. Therefore, it was decided to discontinue placing expensive newspaper notices for future meetings.

Subsequent meetings of the committee were also publicized by FCC Notice, postings in the Region 49 web site, and direct mailings. These subsequent notices were also issued more than 30 days before the meeting date, and copies are included in **Appendix D**.

The Region 49 700 MHz list-serve, <http://groups.yahoo.com/group/RPC49/> was created in November of 2001. The Region 49 web site [www.Region49.org](http://www.Region49.org) and a replacement list serve, [700mail@region49.org](mailto:700mail@region49.org), created November 6, 2003, were also used to exchange information as well as disseminate meeting times, dates, locations, and agendas throughout the regional planning process.

In each of the announcements, invitees were encouraged to provide input into the planning process. During the meetings, participants were encouraged to comment on the meeting's agenda items and any other pertinent matters. Comments were given at the meetings, provided ahead of the meetings on the web sites, and made directly to the chairman, other committee officers, and the subcommittee chairmen.

When comments were made at meetings, the chairman acknowledged the question/comment, and deliberation followed until the commenting party was satisfied or until additional information could be gathered and presented at the next meeting. If voting was necessary, Roberts Rules of Order were followed.

### *2.3 Operations of the Regional Plan Committee*

This committee uses Robert’s Rules of Order to conduct meetings. All decisions are made by clear consensus vote with each public safety agency in attendance having one (1) vote. Additional voting member considerations are listed in the Region 49 Bylaws, **Appendix A**.

The meetings are open to all interested persons and public input time is provided for anyone to express a viewpoint or to have input to the regional planning process. Any changes to the regional plan must be voted on and approved by a majority of members attending a full Regional Planning Committee meeting, in accordance with the procedures contained in Section 2.6 of this plan.

Officers of the committee are the chairman, secretary, and treasurer. They are elected for one year terms at the annual meeting of the committee. If the chairman is unable to serve a complete term, the secretary will serve as chairman until the next committee meeting.

Subcommittees have been formed as needed to work on specific issues. At the first meeting three subcommittees were formed. These subcommittees are intended to work on the details of specific issues and make recommendations to the full committee for the development of the regional plan. Participation in subcommittees is open to any member. The chairman of the Regional Planning Committee appoints each subcommittee chairman. The initial Region 49 subcommittees are listed below:

**Bylaws** Ken Biederman, Burleson County, Chairman (now deceased)

**Plan Writing** Ron Mayworm, City of Bryan, Chairman

**Outreach** Greg Petrey, Brazos County Emergency Communications District, Chairman

A minimum of one (1) meeting per year will be held of the full committee. This annual meeting will be held in Austin, Texas, on October 15<sup>th</sup> of each year, or on the next business day if the 15<sup>th</sup> is a weekend or holiday. The chairman also has the authority to call meetings whenever he/she deems it necessary or in the best interest of the region to convene. In an attempt to offer as many people as possible the opportunity to contribute to the committee, some of the meetings have been, and will continue to be held in various locations within region 49.

A chronological list of meetings, meeting announcements, agendas, and meeting minutes documenting Region 49's progress in 700 MHz development is located in **Appendix D** of this document.

Texas has formed a Statewide Interoperability Executive Committee (SIEC) to manage the 700 MHz interoperability channels. The Texas SIEC includes the chairman of the Region 49 Regional Planning Committee as a member.

## *2.4 Dispute Resolution – Intra-Regional*

In the event an agency disputes the implementation of all or parts of this plan, the agency must notify the chairman of the dispute in writing. This section does not apply to protests over new spectrum assignments (see Section 3.7). The chairman will attempt to resolve the dispute on an informal basis. If a party to the dispute employs the chairman, then the secretary will attempt resolution. If after 60 days the dispute is not resolved, the chairman (or secretary) will appoint an Appeals Subcommittee consisting of five members from jurisdictions in Region 49.

In order to ensure that the appeal process is open and understandable to everyone, the RPC has developed the following procedures. Those involved in the appeal process can expect the RPC and its members to follow these procedures (as may be amended from time to time). Where any matter arises during the course of an appeal that is not addressed in this document, the RPC will do whatever is necessary to enable it to adjudicate the appeal fairly, effectively, and completely. As the RPC gains experience, it will refine and, if necessary, change its policies. Any changes made to the procedure will require an administrative modification to the Regional Plan and will be made available to the public. The RPC will make every effort to process appeals in a timely fashion and issue decisions expeditiously. For each appeal occurrence, a majority of the members of the subcommittee will designate one of its members to be the Chair.

A. If any subcommittee member becomes aware of any facts that would lead an informed person, viewing the matter reasonably and practically, to conclude that another member, whether consciously or unconsciously, would not decide a matter fairly, that member will be prohibited from conducting the appeal unless consent is obtained from all parties to continue. In addition, any party to an appeal may challenge a member on the basis of real or a reasonable apprehension of bias.

B. To ensure the appeal process is kept open and fair to the participants, any correspondence to the subcommittee must be sent to its Chair and be copied to all other subcommittee members and other parties to the appeal, if applicable. Subcommittee members will not contact a party on any matter relevant to the merits of the appeal, unless that member puts all other parties on notice and gives them an opportunity to participate. The appeal process is public in nature and all meetings regarding the appeal will be open to the public.

C. The subcommittee hears appeals from a determination or assignment by the RPC and includes the following: number of channels assigned, ranking in the scoring matrix, interference, or any other criteria that the region shall establish.

D. An official of the entity who filed the original application to the RPC must be the person who files the appeal on behalf of the entity.

E. A notice of appeal must be served upon the RPC. The notice of appeal may be “delivered” by mail, courier, e-mail (must be on the appealing entity’s official letterhead and include the originator’s signature, such as using a scanned image in Portable Document Format of an original letter) or hand delivered, to the Chair and Secretary of the RPC. The Secretary will in-turn transmit notice of the appeal to all then-current RPC members via the listserver within five working days of receipt. To be accepted for consideration the notice of appeal must include:

1. The name and address of the appellant;
2. The name of the person, if any, making the request for an appeal on behalf of the appellant;
3. The address for service of the appellant;
4. The grounds for appeal (a detailed explanation of the appellant’s objections to the determination - describe errors in the decision);
5. A description of the relief requested (what the appellant wants the RPC to do at the end of the appeal);
6. The signature of the appellant or the appellant’s representative.

F. To appeal a determination or assignment, the entity that is subject to the determination must deliver a notice of appeal within twenty-one (21) calendar days after receiving the decision. If a notice of appeal is not delivered within the time required, the right to an appeal is lost.

G. The RPC has the discretion to extend the time to appeal either before or after the twenty-one (21) calendar day deadline. A request for an extension should be made to the Chair and Secretary in writing, and include the reasons for the delay in filing the notice of appeal, and any other reasons which the requester believes support an extension of time to file the appeal. In deciding whether to grant an extension, the RPC will consider whether fairness requires an extension. The RPC will consider the length of the delay, the reasons for the delay, any prejudice to those affected by the delay, and any adverse impact that may result from an extension. Other factors not identified here could also be relevant, depending on the circumstances of the particular case.

H. The RPC may reject a notice of appeal if it is determined that the appellant does not have standing to appeal, or the RPC does not have jurisdiction over the subject matter or the remedy sought. Before an appeal is rejected, the RPC Chair will inform the appellant of this in writing, with reasons, and give the appellant a twenty-one (21) calendar day opportunity to make additions or corrections.

I. The Appeals Subcommittee has the discretion to add any other person who may be “affected” by the appeal as a party to the appeal. Anyone desiring to obtain party status should make a written request to the Appeals Subcommittee Chair as early as possible. The written request should contain the following information:

1. The name, address, telephone number and email address (if any), of the person submitting the request;
2. A detailed description of how the person is “affected” by the notice of appeal and
3. The reasons why the person should be included in the appeal; and
4. The signature of the person submitting the request.

J. The Appeals Subcommittee may also invite or permit someone to participate in a hearing as an intervener. Interveners are generally individuals or groups that do not meet the criteria to become a party (i.e. “may be affected by the appeal”) but have sufficient interest in, or some relevant expertise or view in relation to the subject matter of the appeal. Anyone wanting to take part in an appeal as an intervener should send a written request to the Appeals Subcommittee Chair. The written request should contain information that qualifies the intervener’s interest and expertise to assist in the matter while also demonstrating why they should not be considered a party to the appeal. Prior to inviting or permitting a person to participate in a proceeding as an intervener, or deciding on the extent of that participation, the Appeals Committee will provide all parties with an opportunity to comment if they wish to do so.

K. An appeal may be conducted by way of written submissions, oral hearing or a combination of both. The Appeals Subcommittee will determine the appropriate type of appeal after a complete notice of appeal has been received.

L. The Appeals Subcommittee will follow the general rule that the burden or responsibility for proving a fact lies with the person who asserts it.

M. Any party intending to present expert evidence at a hearing will be required to provide the subcommittee, and all other parties to the appeal, with reasonable advance notice that an expert will be called to give an opinion. The notice should include a brief statement of the expert’s qualifications and areas of expertise. If a party intends to produce, at a hearing, a written statement or report prepared by an expert, a copy of the statement or report should be provided to the Subcommittee and all parties to the appeal within a reasonable time before the statement or report is given in evidence. Unless there are compelling reasons for later admission, expert reports should be distributed not less than twenty-one (21) calendar days prior to the hearing date.

N. If a party will be referring to a document that was not provided to the Subcommittee and all parties prior to the hearing, sufficient copies of the document must be brought to the hearing for the Subcommittee and all other parties.

O. If a party is not satisfied with the decision of the Appeals Subcommittee, he or she

can appeal that decision to the 700 MHz National Planning Oversight Committee or other body formally designated by the FCC to handle matters of this nature.

As a last resort, the dispute will be forwarded to the Federal Communications Commission for final resolution.

## *2.5 Dispute Resolution – Inter-Regional*

In the event that a dispute arises between Region 49 and an adjacent region or regions, regarding channel allotments or assignments, that cannot be resolved within 60 days, the parties to the dispute will request a hearing by the appropriate subcommittee of the National Public Safety Telecommunications Council (NPSTC). See **Appendix H** for details and Inter-Regional Dispute Resolution Agreements signed by adjacent Regions 40, 50, 51, and 53.

## *2.6 Future Planning*

Region 49 will maintain a website on which all plan documents, meetings announcements, meeting minutes, and other pertinent information will be maintained. It is anticipated that two types of plan modifications will be made in the future: administrative changes that do not alter spectrum allotments in the plan, and changes that do alter the spectrum allotments in the plan. Each of these types of changes will be handled by a different process.

- A. From time to time the Committee may need to make changes to the plan that are purely administrative in nature, and that do not alter any spectrum allotments. Examples of such changes include changes in officer positions, changes in meetings schedules, changes in application processing procedures, etc.

Proposed administrative changes to the plan will be presented to the Committee at a properly scheduled meeting, and adopted at that meeting, if possible. Upon a vote by the majority of members in attendance at that meeting, consideration of the change may be held over for subsequent meetings to allow further information to be collected or further debate to occur. Once the proposed change is adopted by the Committee, the amended plan will be filed with the FCC for formal ratification. Copies will also be provided to the chairmen of the adjoining regions so they are aware of the administrative changes.

- B. From time to time the Committee may need to make changes to the plan that alters the allotment of channels. Examples of such changes include situations in which one county-like area has fully exhausted their initial allotment and needs additional channels to meet their demonstrated need,

while other county-like areas have demonstrated no interest in planning or funding the use of their allotted channels.

Proposed changes of this nature will be presented to the Committee at a properly scheduled meeting, and will be considered at that meeting and one subsequent meeting. Once the proposed change is approved by the Committee, notification of the proposed change will be sent to the chairmen of the adjacent regions for their concurrence. The adjoining regions will be requested to provide their comments or consent within 45 calendar days of their receipt of the notification.

Once adjacent regions' comments or consent is received, or the 45 day period has expired, the Committee will again consider and vote on the proposed change at a properly scheduled meeting. Upon adoption of the change by the Committee, the amended plan will be submitted to the FCC for ratification.

### **3 Regional Plan Administration**

#### *3.1 Allotment of Narrowband "General Use" Channels*

This regional plan initially uses the National Public Safety Telecommunications Council's (NPSTC) 700 MHz general use channel sort as shown on the CAPRAD database for narrowband general use channels. The CAPRAD sort and allotment process used many factors, including population densities and geographic terrain features, to achieve nationwide allotments that are efficient, while minimizing co-channel and adjacent channel interference both within and between neighboring regions. Region 49 utilizes the CAPRAD database and will maintain the regional plan and current frequency allotment/assignment information on the database.

It must be emphasized that the initial allotments produced by the CAPRAD sort are starting points for frequency assignments in all regions. The major purpose of the CAPRAD sort was to establish non-interfering allotments along all regional borders, thus greatly simplifying the initial coordination between all adjoining regions. Indeed, the technical proposal paper for the CAPRAD sort stated, "Pre-allotments may be altered without the need for inter-regional coordination as long as adjacent regions are not impacted. Changes that impact adjacent region(s) can only be made with inter-regional concurrence(s)."

The Region 49 Regional Planning Committee has both the ability to initiate and accept recommendations, and the authority to change the original frequency allotments.

If at any time a system is assigned channels within Region 49 and the system cannot be developed within the agreed terms, the channels will be returned to the original county pool allotment and again be available to other agencies in the region.

Allotments to all the counties within Region 49 have been made utilizing the national CAPRAD database sort. Allotments have been made in 25 KHz groups to allow for various digital technologies to be implemented. Region 49 agrees with the NCC's recommendation that assignments be made on the basis of one 25 KHz channel for every two (2) voice channel requests, and one 12.5 KHz channel for each narrowband data channel request. It is expected that all agencies requesting spectrum during the initial filing window (see Section 3.6.A) will be assigned channels if plan requirements and interference standards are met. Agencies using Frequency Division Multiplexing (FDMA) will be expected to maintain 12.5 KHz equivalency when developing systems and will be required to utilize both 12.5 KHz portions of the 25 KHz block. In most cases, this will require geographic separation of each 12.5 KHz adjacent channel. To the maximum extent possible, and in order to promote spectrum efficiency, Region 49 will ensure that systems allocated 25 KHz channel blocks will utilize all of the channel, and not "orphan" any portions of an assigned channel. (See Section 3.5, below)

### *3.2 "Limited Area" Operations*

In the implementation of 700 MHz public safety systems throughout Region 49, there may be opportunities for increased channel reuse by developing radio systems for "limited area" type operations. Examples of those who may be able to capitalize on this opportunity include hospitals, stadiums, malls, places of public gathering, universities, and ports. In many instances, these facilities require a smaller or more specific geographical coverage area than was assumed in the initial channel packing plan, and may be able to reuse channels more efficiently. These "limited area" type systems also, in many cases, require in-building or confined space/ tunnel radio coverage or communications along a linear pathway, such as a right of way.

To encourage applicants to develop such "limited area" type systems, the Region 49 Regional Planning Committee has determined that the use of "limited area" channels will supplement, and not reduce the number of a county's allotted channels. Channels assigned to this type operation can lead to effective system development, along with increased spectral efficiency, if the service contour and interference protection needs of the system are carefully considered in system planning. System parameters must be used that are appropriate to the service area.

The following criteria apply to channels for "limited area" operations:

The 40dBu service contour of the proposed system must not extend more than 2 miles beyond the proposed service area. If this 2-mile distance extends into an adjacent region, the applicant must obtain concurrence from the adjacent region. For co-channel

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assignments, the 40dBu (50,50) service contour of the proposed system may touch, but not overlap, the 5dBu (50,50) contour of a co-channel system being protected. A proposed system shall be allowed to have its 60dBu (50,50) contour touch, but not overlap the 40dBu (50,50) service contour of an adjacent/alternate system being protected. Evaluations should be made in both directions to ensure compliance. Reduced external antenna height, along with reduced ERP, directional antennas, distributed antenna systems, and radiating “leaky coax,” are examples of tools that should be utilized in the development of these type systems.

Region 49 will ensure that these types of systems will not interfere with co-channel or adjacent channel users within the region or its adjacent regions. The chairman, or any agency with co-channel or adjacent channel assignments, or any agency with co-channel or adjacent channel allotments, may request engineering studies from the applicant that indicate no harmful interference will be introduced to any co-channel or adjacent channel user prior to application approval. The committee is the final authority on parameters associated with “limited area” type operations.

If Region 49 receives a request for “limited area” use and the proposed service contour encroaches into an adjacent region before the channel is assigned to a specific system in that region, the proposed system must be modified so its service contour does not encroach into the adjacent region or the applicant must supply the Region 49 700 MHz Regional Planning Committee with written concurrence from the adjacent region allowing the design.

### 3.3 “Give Back” Channels

When applying for new 700 MHz channels, the Regional Planning Committee expects applicants to relinquish an amount of currently used spectrum (“give back channels”) and make that spectrum again available for use. This currently licensed spectrum may be in any public safety band. This requirement does not apply to agencies with existing 800 MHz systems that are requesting 700 MHz channels for system expansion. The number of channels an applicant may retain after this “give back” may include those needed for interoperable communications with surrounding jurisdictions. If an agency considers the number of channels relinquished by the applicant to be insufficient, their objection will be handled in the same manner as an assignment dispute (see section 3.7).

It is anticipated each agency will have a certain migration period during which both their existing frequencies and their 700 MHz assignments will be utilized. The Regional Planning Committee will review and approve an appropriate “give back” timetable that will allow a specified time period for new system optimization. This will make an applicant’s legacy system available to the applicant for a limited time period during migration, implementation, and optimization of the new system. When both the applicant and the Regional Planning Committee agree upon the number of “give back” channels and a date is established for implementation of the new system, the applicant will provide

the committee with a ‘giveback agreement’ letter containing all pertinent give back channel information. This will enable other agencies in the area to benefit from, license, and implement the applicant’s “give back” channels.

Frequency “give back” requirements also apply for regional systems where system participants maintain discrete licenses for their own operations. In the case of a partnership system, all participating political subdivisions or agencies are required to participate in the “give back” plan. Should one political subdivision or agency act as host of a regional system, both the host agency and the constituent agencies must participate in the “give back” plan. Region 49 may utilize any mechanism needed to retain “give back” frequencies within the region and allow for maximum spectral use.

Frequencies used for non-voice critical infrastructure support functions [such as Supervisory Control and Data Acquisition (SCADA) systems] as well as frequencies that are used for interoperability with other regional, state, or national agencies that rely on other frequency bands for emergency operations (such as, but not limited to, the Texas Interoperability Channel Plan channels), may be exempted by the committee as candidates for “give back”. Frequencies used by an applicant for such purposes, as well as the specific use and a network/ system diagram, must be shown in the application documentation package to enable the Regional Planning Committee to consider exemptions.

Operational Fixed, or any frequency or radio sub-system used for fixed mode of operations to support the operation of another radio system shall be considered part of the “give back” along with the fundamental system being returned. They comprise an inclusive unit.

Microwave frequencies, or systems licensed within the “Microwave Public Safety Pool” (radio service Code “MW”) shall be exempt from this requirement.

In cases of hardship or untoward implementation, the Regional Planning Committee will consider, on a case-by-case basis, extensions of the “give back” timetable. Should there be a protest the dispute resolution process in Section 2.4 of this document shall apply.

### *3.4 Low Power Channels*

The FCC in the 700 MHz band plan set aside channels 1 - 8 paired with 961 – 968, and channels 949 –958 paired with 1909 – 1918, for on-scene incident response purposes using low power mobiles and portables subject to Commission-approved regional plans. Channels 9 –12 paired with 969 – 972, and channels 959 – 960 paired with 1919 – 1920, are licensed nationwide for itinerant operation. Transmitter power on any of these channels must not exceed 2 watts effective radiated power (ERP). All of these channels may be operated in either the analog or the digital mode.

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This plan does not limit use to analog only operations, and channels are intended for use in a wide variety of applications that may require digital modulation types as well.

On scene temporary base and mobile relay stations are allowed (to the extent FCC rules allow) with antenna height limit of 6.1 meters (20 feet) above ground level (AGL). However, users are encouraged to operate in simplex mode with the least amount of power to reliably maintain communications whenever possible.

In its dialog leading up to the rules allocating the twenty-four low power 6.25 KHz frequency pairs (of which eighteen fall under RPC jurisdiction), the FCC suggested that there is a potential for multiple low power applications. They stated that, absent a compelling showing, a shared approach should be employed rather than making exclusive assignments for each specific application, since low power operations can co-exist, in relatively close proximity, on the same frequencies, with minimal potential for interference due to the 2 watt ERP restriction. Although advantages exist in not making assignments, the reverse is also true. If, for example, firefighters operate on a specific channel or set of channels in one area, there is some logic in replicating that usage throughout the region for firefighter equipment. If there are no assignments, such a replication is unlikely. In seeking the middle ground, with positive attributes both for and against assignments, we adopt the following assignments associated with the eighteen (18) low power channels for which the Region 49 Regional Planning Committee has responsibility:

- Generic – Base channel #'s 1-4 and 949-952 are designated as generic low power channels for licensing and use by all disciplines of public safety agencies operating in Region 49, and the complementary mobile channels #'s 961-964 and 1909-1912 are set aside as generic low power channels for licensing and use by all disciplines of public safety agencies operating in Region 49.
- Fire/ EMS – Base channel #'s 5-8 are designated as Fire/Emergency Medical low power channels for licensing and primary use by the Fire/Emergency Medical disciplines, and the complementary mobile channel #'s 965-968 are set aside as Fire/Emergency Medical low power channels also for licensing and primary use by the Fire/Emergency Medical disciplines.
- Law – Base channel #'s 953-956 are designated as Law Enforcement low power channels for licensing and primary use by the Law Enforcement discipline, and the complementary mobile channel #'s 1913-1916 are set aside as Law Enforcement low power channels also for licensing and primary use by the Law Enforcement discipline.

Multidisciplinary Joint Public Safety Operations – Base channel #'s 957-958 are designated as Multidisciplinary Joint Public Safety Operations low power channels for licensing and the complementary mobile channel #'s 1917-1918 are also designated as Multidisciplinary Joint Public Safety Operations low power channels for use by political subdivisions and public safety agencies operating under a unified command at a common incident for the express mission of safety of life, property or environment.

Simplex operations may occur on either the base or mobile channels. Users are cautioned to coordinate on-scene use among all agencies involved, particularly when the use of repeater modes is possible at, or in proximity to, a common incident. Users should license multiple channels and be prepared to operate on alternate channels at any given operational area. The Region 49 Regional Planning Committee urges all 700 MHz users to have the capability to access all of the FCC approved low power and interoperability channels in both repeater and simplex modes. Under no circumstances may a user claim a low power channel as exclusively theirs. The 700 MHz interoperability channels are administered by the Texas Statewide Interoperability Executive Committee.

### 3.5 “Orphaned Channels”

The narrowband pool allotments in Region 49 have a channel bandwidth of 25 KHz. These 25 KHz allotments have been characterized as “technology neutral” and flexible enough to accommodate diverse technologies utilizing multiple bandwidths. If agencies choose a technology that requires less than 25 KHz channel bandwidth for their system, there is the potential for residual, “orphaned channels” of 6.25 KHz or 12.5 KHz bandwidth immediately adjacent to the assigned channel within a given county area. An “orphan channel” may be used at another location and/or by another licensee within the county area where it was originally assigned, if it meets co-channel and adjacent channel interference criteria.

When it is in the best interest of public safety communications and efficient spectrum use within the region, the Regional Planning Committee shall have the authority to move these “orphan channel” allotments, and/or co-channel or adjacent channel allotments affected by the movement of “orphan channels,” to other areas throughout the region, as deemed necessary, to maintain spectrum efficiency and/or minimize co-channel or adjacent channel interference. If, to accommodate an applicant’s request for channel assignments, it is necessary to move a full 25 KHz channel allotment, or a portion thereof, to a location outside of the county area in which it was originally allotted, the Regional Planning Committee will determine if the request meets frequency coordination and interference protection guidelines, and should be moved to accommodate the request.

If the movement of a full or partial channel allotment is deemed in the best interest of the public safety community, and the full or partial channel is relocated less than 10 miles outside the originally-allocated county boundaries, and both the old and new locations are more than 30 miles from the boundaries of any region adjoining Region 49, no plan amendment will be required. These channel allotment movements will be documented on the National Public Safety Telecommunications Council CAPRAD database.

If a full or partial channel allotment does not meet co-channel and adjacent channel interference criteria when moving it within the 10 mile distance as listed above, and it is determined by the committee that the full or partial channel cannot be utilized in the

region without exceeding the 10 mile distance, Region 49 will reallocate the full or partial channel to a location where its potential use will maintain maximum spectral efficiency.

If the movement of a full or partial channel allotment is deemed in the best interest of the public safety community, and the relocation requires moving a channel allotment from one region to another in the interest of inter-regional sharing and cooperation, each region shall amend its plan and submit the amended plan to the FCC accompanied with written concurrence statements from the participating and adjoining regions.

### *3.6 Procedure for Requesting Channel Assignments*

- A. Upon FCC approval of this plan, the chairman will announce the opening of an initial filing window, and that specific channels have been allotted to each county area in the region. All available methods will be used to notify public safety entities of the filing window and channel availability in the region (see Section 2.1). Subsequent filing windows will be established at 6 month intervals.

Following the close of the first filing window, seven (7) successive filing windows will occur at six month intervals. In addition to processing any applications received during the eighth filing window, the Committee will also then make a decision on whether to add additional filing windows, or to allow the filing window approach to automatically sunset.

If no action is taken by the Committee to add additional filing windows, subsequent applications will be received and processed on a first-come, first served basis. Channel assignments will not be constrained to the allocations of this plan, but, instead, will be made opportunistically to allow for the best possible spectrum utilization while meeting the needs of active applicants. This could result in spectrum allotted to some county-like areas, but has sat fallow for four years, being applied for and made productive by applicants who are making active use of the 700 MHz spectrum.

- B. All requests for assignments of channels will be considered on a first come, first served basis. Multiple requests for the same channels arriving in the same filing window, and requests for more channels than are allotted to the applicant's area, will be processed in accordance with the priority matrix given in Section 4 of this plan. Region 49 supports the National Coordination Committee Pre-Assignment Rules and Recommendations listed in **Appendix F**, and will use these guidelines to determine if an application submitted to the Regional Planning Committee meets regional planning and interference protection standards. It is recommended that applicants familiarize themselves with these standards prior to submitting their applications. In general, and unless otherwise noted, the Region 49 Regional Planning Committee will adhere to the published National

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Coordination Committee Guidelines for 700 MHz Public Safety Regional Planning Committees.

- C. When applying for new 700 MHz channels, the Regional Planning Committee expects applicants to work with neighboring agencies to promote and continue the establishment of interoperability within their communities, to allow for equitable distribution of the frequency allotments, and to promote efficient frequency use. The Region 49 Regional Planning Committee expects applicants to recognize that moving to the 700 MHz band may create a degree of isolation between themselves and neighboring agencies, and expects applicants to maintain or improve interoperability with their neighbors.
- D. To request an assignment of channels from Region 49, a full application package must be submitted to the NPSTC -Sponsored CAPRAD database at <http://caprad.nlectc.du.edu/login/home>. The application package must include:
  1. FCC Form 601 (or its equivalent form as required by the FCC) with all appropriate schedules and attachments;
  2. a description of the proposed system;
  3. a justification for the additional spectrum;
  4. a proposed system loading schedule;
  5. a proposed system implementation schedule;
  6. an interference prediction map using the current version of TIA/EIA TSB 88 guidelines;
  7. documents indicating agency-funding commitments sufficient to fund the development of the proposed system(s);
  8. a list of all frequencies that will continue to be used by the applicant, and their specific uses;
  9. a list of “give-back” channels, if applicable;
  10. a list of all Region 49 entities with co-channel or adjacent channel assignments, and a statement indicating the date and manner by which each of these entities was notified of this application; and
  11. a statement acknowledging the FCCs deadline of 12/31/2016 for operating at 6.25 KHz channel spacing, or its equivalent.

Exceptions in accepting applications will be made by the chairman if applicants have demonstrated a need for 700 MHz channels and cannot access the CAPRAD database.

E. The secretary will cause all then-current Regional Planning Committee members to be notified by e-mail that an application is available for review, and notice of the application will also be posted on the Region’s web site and list server. Requests will be considered and approved, providing that harmful interference is not caused to existing users or incumbent broadcasters. The technical parameters defining the limits of any possible interference are given in section 7.1 of this plan. Service area and service contours should also meet the values designated in section 7.1 of this plan. As frequencies allocated to the counties are assigned and used, requests for short-spacing of channels that meet the FCC’s criteria for short-spacing will be considered on a case-by-case basis.

Absent a protest within 60 calendar days of the secretary’s e-mail notification, the application will be approved, and (if applicable), upon receipt of a “giveback agreement” letter (see Section 3.3), the chairman or his delegate will submit it, through the CAPRAD database, to the applicant’s preferred FCC certified frequency coordinator for processing. This process meets the requirements of FCC Rule 90.176 (c). The CAPRAD database will reflect the approved application and place the channels for the proposed system in “pre-license” status.

### *3.7 Assignment Disputes*

An agency may protest a proposed system within 60 calendar days following the secretary’s e-mail notification. Protests will only be considered if the requested assignment does not conform to plan criteria or the objecting agency or the chairman can show that harmful interference is likely based on the information submitted in the application. If an agency with licensed, or pre-licensed/region assigned, co-channel or adjacent channel assignments objects to a proposed assignment due to concerns about potential interference, the objecting agency may request field tests be done to confirm or refute the interference potential. The completion of these field tests will be required for Region 49 application approval. Service and interference contours of the proposed system(s) should meet values designated in Section 7.1 of this document. Any costs associated with field tests or any other requirements for obtaining regional approval are the responsibility of the agency submitting the application to Region 49. The parties involved must resolve the assignment dispute and notify the chairman within 120 calendar days. If the parties involved cannot resolve the assignment dispute within that time frame, the dispute will be submitted at the next meeting of the full Regional Planning Committee for a vote. If approved, the application will be submitted through the CAPRAD database to the applicant’s chosen FCC-certified frequency coordinator for processing.

Any application that has been modified in any way that would change the systems' coverage or interference contours must be resubmitted in the same manner as the original application, and new 60 day e-mail notifications will be made.

### *3.8 Wideband Data*

This plan does not make any allotments of the general use wideband data channels. Since these channels may be used by licensees in 50 KHz, 100 KHz, or 150 KHz total channel bandwidth configurations, the RPC was unable to establish an acceptable mechanism to allot this spectrum on a geographic or population basis. Further, since most individual agencies are not able to attest to their specific needs for this wideband spectrum at the present time, the RPC has determined it to be best to rely on applications received during the filing windows to determine the most appropriate and closely-packed assignment of channels, based on the transmitter sites and bandwidths selected by individual applicants.

### *3.9 NPSPAC Channels*

If a 700 MHz applicant has not yet fully exhausted its 821 MHz (806 MHz after Rebanding) allotments, the 700 MHz RPC should encourage the applicant, where technically appropriate, to fully utilize their 821 MHz allotments first. The purpose for this is to ensure maximum utilization of all allotted spectrum with similar technical characteristics.

## **4 Priority Matrix**

In the event that several requests for narrowband channel assignments conflict and cannot all be accommodated, the following scoring matrix will be used to determine priority for assignment. This matrix will only be used if two or more requests are received in the same filing window for the same channels. Otherwise, the first come first served procedure of Section 3.6.B will be used.

Priority is given to the first application filed within a filing window, as determined by the CAPRAD posting date, postmark, or their equivalent (10 points).

- Priority is given to users fundamentally involved with the protection of life and property (15 points)
- Priority is given to multi-agency systems that promote multi-agency, inter-discipline interoperable communications. These systems can be either a group of separate

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departments within a large agency or groups of agencies operating together under a large blanket agency, or a combination of both. (25 points)

Priority is given to systems that achieve spectrum efficiency through high levels of channel loading. (25 points)

□ Documentation of proposed funding and proof of financial commitment, accompanied by a RFP (Request for Proposal) outlining the design of the proposed system and detailing the development of the requested channels. (25 points)

The percentage of the applicant's existing frequencies that will be available for re-use (give-back frequencies). (10 points)

This scoring process will be performed by the five member Intra-Regional Appeals Subcommittee (see section 2.4) using the above criteria.

### **5 Process for handling unformed adjacent Regions**

All four of the regions adjacent to Region 49 have formed their committees and have elected their chairmen. Therefore, there is no need for a process for handling unformed adjacent regions.

### **6 Coordination with Adjacent Regions**

The Regions adjacent to Region 49 are listed below:

Region 40  
Region 50  
Region 51  
Region 53

Region 49 has coordinated channel allotments and received concurrence from all its bordering regions by providing copies of this plan (including channel allotments) to each adjacent region using the CAPRAD database and e-mail, and by mailing hard copies of the plan to all adjacent regions' chairmen.

Region 49's plan will also be available for viewing by all interested parties via the NPSTC CAPRAD 700 MHz database. The NPSTC pre-coordination database can be used to determine which channels are available that will not interfere with Region 49 allotments or systems. The CAPRAD database and its associated packing plan provides

minimum channel allotments for all of Region 49's bordering regions. This method was recommended by the NCC Implementation Subcommittee as a way to assure that adjacent regions, which did not enter the regional planning process immediately, would not find all frequencies already allotted or assigned at their borders.

Therefore, adjacent Regions 40, 50, 51, and 53 should all be able to satisfy voice and narrowband data requests along their border areas with Region 49. However, if an adjacent region has difficulties satisfying intra-regional requests due to channel allocation within Region 49, this committee pledges to work with that adjacent region to resolve any issues that might hinder interoperability or reduce any benefit to public safety communications.

## 7 System Design/Efficiency Requirements

### 7.1 *Interference Protection*

The channel allotments are based on the assumption that systems will be engineered on an interference-limited basis, not a noise floor-limited basis. Agencies are expected to design their systems for maximum signal levels within their service area and minimum levels in the service areas of other co-channel users. A jurisdiction's service contour is normally the geographical boundaries of the agency served (its service area) plus an area three to five miles beyond.

Systems should be designed for minimum signal strength of 40 dBu in the system's service contour, while minimizing signal power out of that area. TIA/EIA TSB88-A (or latest version) will be used to determine harmful interference, assuming 40 dBu, or greater, signal in all systems' service contours. This may require patterned antennas and extra sites compared to a design that assumes noise limited coverage.

To maximize spectrum utilization, prudent engineering practices and receivers of the highest quality must be used in systems. Given a choice of radios in a given technology family, agencies should choose the units with the best specifications. This plan will not protect agencies from interference if their systems are under-constructed (i.e., portions of the desired service area have signal strength less than 40 dBu), or utilize low quality receivers.

Region 49 adopts the interference protection recommendations listed in Appendix K of the Regional Planning Committee Guidelines published by the National Coordination Committee (NCC), and included in this plan as **Appendix F**.

### 7.2 *Spectrum Efficiency Standards*

It is the goal of the FCC for radio equipment to use one voice channel per 6.25 KHz of spectrum. Requests for channel assignments in Region 49 must include an acknowledgement of the 12/31/2016 deadline for converting all equipment to 6.25 KHz or 6.25 KHz equivalent technology. For narrowband mobile data requests, one mobile data channel will consist of two (2) contiguous 6.25 KHz channels/one (1) 12.5 KHz channel. Narrowband 6.25 KHz channels may be aggregated for data use to a maximum bandwidth of 25 KHz. As 6.25 KHz migration continues, “orphaned” 6.25 KHz channels may be re-allotted to maintain consistent grouping and utilization of 25 KHz blocks (see Section 3.5).

Region 49 encourages small agencies to partner with other agencies in multi-agency or regional systems as they promote spectrum efficiency and both small and large agency capacity needs can be met. Loading criteria can also be achieved in multi-agency systems that will allow greater efficiency for all agencies involved than could be achieved individually.

### 7.3 System Loading Criteria

Efficient use of spectrum requires minimum channel loading standards both for trunked and conventional system architectures. Subscriber loading for conventional systems in the 700 MHz band will be approved on a case-by-case basis

FCC rules require that systems using 6 or more channels use trunking technology. However, trunking may be used for systems with fewer channels. The following table indicates the minimum subscriber loading criteria for trunked systems in the 700 MHz band:

<b>Subscriber units</b>	<b>12.5 KHz Talk Paths (or equivalent)</b>	<b>Subscriber units</b>	<b>12.5 KHz Talk Paths (or equivalent)</b>
50-100	2	300-350	7
100-150	3	350-400	8
150-200	4	400-450	9
200-250	5	450-500	10
250-300	6		

Additional channels may be assigned for larger trunked systems at the rate of one additional talk path per 75 subscriber units exceeding 500 units. Applicants requesting additional frequencies to expand an existing system must show loading of 100 % or more on their existing system.

Justification for adding frequencies or retaining existing frequencies may be provided by a traffic loading study instead of loading by the count of subscriber units per talk path. It

will be the responsibility of the applicant to provide a verifiable study showing sufficient airtime usage to merit additional frequencies. Documentation of airtime usage, excluding telephone interconnect air time, during the peak busy hour on three consecutive days will be required to demonstrate system loading.

Should a demand for frequencies exist in the region after the supply of assignable frequencies has been exhausted, any system having frequencies assigned under this plan for four years or longer that is not loaded to a least 70 % of subscriber loading may be required to surrender one or more frequencies for reassignment .

#### *7.4 Expansion of Existing 800 MHz Systems*

Licensees of existing 800 MHz systems that wish to expand by using 700 MHz frequencies must meet the requirements of the FCC and both this 700 MHz plan and the Region 49 800 MHz Public Safety Radio Communications Plan. If the two Region 49 plans are in conflict, the dispute resolution process outlined in Section 2.4 will be used on a case-by-case basis to determine which plan governs.

#### *7.5 System Implementation*

TV station KAKW, located in Killeen, Texas, utilizes analog TV channel 62. Channel 62's frequencies are adjacent to some 700 MHz public safety allocations. The frequency sort in region 49 includes both channels that can co-exist with TV channel 62 and channels that cannot, to prepare for use when KAKW has left the band. The Region 49 Regional Planning Committee will utilize NCC Implementation Subcommittee documentation titled "Appendix L - DTV Transition" to provide the criteria which will be used, per FCC rules, to protect existing TV stations from land mobile use on 700 MHz public safety channels. Other areas in Region 49 are capable of immediately implementing systems using any 700 MHz public safety channels. In cases where there are no restrictions to implementation due to incumbent co-channel broadcasters, implementation of systems will adhere to guidelines in FCC rule 90.529 (b) and (c).

An agency may file a request with the Regional Planning Committee chairman for an extension of time to implement their system. The request should include all details describing why the system has not been implemented, and a new implementation schedule. The request will be processed in the same manner as an application for assignments (see section 3.6.E), with any dispute handled according to section 3.7.

## **8 Interoperability Channels**

### *8.1 Introduction*

The ability of agencies to effectively respond to mutual aid requests directly depends on their ability to communicate with each other. Texas is subject to a variety of natural disasters and includes facilities which may be susceptible to a man-made disasters or weapons of mass destruction attacks. Mutual aid is required among agencies. This plan supports the communications necessary for effective mutual aid, including, but not limited to, the use of Project 25 Common Air Interface standards and accepted common channel names for interoperability channels.

The addition of new communications systems on the 700 MHz band may increase overall interoperability challenges rather than lessen them. While some new 700 MHz systems may completely replace all legacy systems in some areas, most will probably add to the mix of communications options available in an area.

Therefore, as new 700 MHz systems are planned and deployed, it will be extremely important for their operators to be well informed about other legacy systems in all other bands that are operating in their area, or in areas where they may be called upon to provide mutual aid assistance. Since it is unlikely that the time will come when all public safety communications system operate in a single frequency band with a single technology, only good system planning and cooperation will enable reasonable levels of interoperability to be sustained.

The most common strategy that has been followed in the past, and that this plan anticipates will be followed in Region 49 700 MHz system deployments, is the concept of new systems incorporating appropriate interoperability into their plans and designs, rather than expecting the legacy systems to figure out how to operate with the new system. New 700 MHz systems not only need to meet the interoperability requirements for that band; they also need to provide mechanisms to interoperate with VHF, UHF, and other users to a level that is appropriate for their circumstances..

The State of Texas administers the 700 MHz interoperability channels via the Texas Statewide Interoperability Executive Committee (TSIEC) under National Coordination Committee's (NCC) guidelines. The TSIEC has published technical and operational standards for use of the interoperability channels, and it is anticipated that the TSIEC will continue to expand and update these standards as necessary. The Region 49 700 MHz Regional Planning Committee supports the Texas Statewide Interoperability Executive Committee. The Chairman of the Region 49 700 MHz Regional Planning Committee, or his delegate, is a member of the Texas Statewide Interoperability Executive Committee (TSIEC) and represents Region 49. If at any time the TSIEC is unable to function in the role of administering the interoperability channels in the 700 MHz band, this committee will assume that role in Region 49, and notify the FCC in writing of the change in administrative duties.

## *8.2 Tactical Channels*

Due to the immediate availability of 700 MHz public safety channels in most areas of central Texas, Region 49 will not set aside additional channels for interoperability within the region. It is anticipated that the sixty-four FCC designated interoperability channels (6.25 KHz) will be sufficient to provide voice and data interoperability in Region 49.

All mobile and portable units operating under this plan and utilizing 700 MHz channels must be programmed with the minimum number of channels required either by NCC guidelines or by the Texas Statewide Interoperability Executive Committee, whichever number is greater, both in the repeater and direct mode. Channel displays will be in accordance with the NCC guidelines that have common alphanumeric nomenclature to avoid any misinterpretation of their identity.

### *8.3 Deployable Systems*

Region 49 strongly supports use of deployable systems, both conventional and trunked. Deployable systems are prepackaged systems that can deploy by ground or air to an incident to provide additional coverage and capacity on designated 700 MHz interoperability channels and/or agency specific general use channels. This will minimize the expense of installing extensive fixed infrastructure in all areas while still providing mission critical functionalities. The committee recognizes the difficulty of providing complete coverage in all areas due to financial, demographic and geographical constraints.

Agencies should have conventional deployable systems capable of being operated on any of the FCC designated/NCC recommended interoperability tactical channels. Those agencies that are part of a multi-agency trunked system and commonly provide mutual aid to each other are encouraged to have trunked deployable systems that operate on the tactical channels designated by the FCC for this use. The TSIEC will develop the operational details for deploying these systems.

### *8.4 Monitoring of Calling Channels*

700 MHz general use channel licensees in Region 49 will be responsible for monitoring interoperable calling channels in the manner prescribed by the TSIEC. **Appendix E** includes NCC documents containing Interoperability guidelines.

## **9 Future Planning**

The provisions in this plan, including, but not limited to, annual meetings, annual review of channel allotments, procedures for modification of allotments, and procedures for modification of the plan itself, constitute the provisions for future planning in Region 49.

## 10 Certification

I hereby certify that all planning committee meetings, including subcommittee or executive committee meetings were open to the public. A summary of the deliberations of the committee pursuant to adopting this plan can be found in **Appendix D**, in the minutes of the \_\_\_\_\_ (date) \_\_\_\_\_ Regional Planning Committee meeting.

Ronald G. Mayworm  
Chairman, Region 49  
\_\_\_\_\_ (date) \_\_\_\_\_

## Appendices

<b>Appendix A</b>	<b>Bylaws</b>
<b>Appendix B</b>	<b>Region 49 Members, Agencies, Contact Information and Voting Status</b>
<b>Appendix D</b>	<b>Copies of Public Notices, list of Meetings, agendas, and minutes</b>
<b>Appendix E</b>	<b>700 MHz Interoperability channel recommended nomenclature and Texas State Interoperability Committee guidelines</b>
<b>Appendix F</b>	<b>NCC 700 MHz Pre-Assignment Rules/Recommendations</b>
<b>Appendix G</b>	<b>Region 49 Channel allotments</b>
<b>Appendix H</b>	<b>Inter Regional Dispute Resolution Agreement</b>
<b>Appendix I</b>	<b>DTV Protection and Incumbency</b>

## Appendix A

### **BYLAWS OF REGION 49 (CENTRAL TEXAS) 700 MHZ REGIONAL PLANNING COMMITTEE**

## ARTICLE I

### NAME & PURPOSE

The name of this committee shall be the Region 49 (Central Texas) 700 Mhz Regional Planning Committee. Its primary purpose is to foster cooperation between members, to develop a Regional Plan for use of the 700 Mhz Public Safety band in the 30 county Central Texas area, and to implement that plan. This committee is formed in accordance with 47 USC 90.257 and the procedures detailed in the Federal Communication's *First Report and Order and Third Notice of Proposed Rulemaking* (14 FCC Rcd 152), and the *Second Memorandum Opinion and Order* (15 FCC Rcd 16851).

## ARTICLE II

### MEMBERS

For purposes of this Article, the term “member,” unless otherwise specified, refers to both voting and nonvoting members.

- 2.1 Number, Election and Qualification. The Regional Committee shall have two classes of members, “voting members” and “non-voting members.” New members may be added at annual, special, or regular meetings.
  - A. Voting Members. Voting members shall consist of one representative from any agency engaged in public safety in the thirty (30) county Central Texas area (the Counties of Bastrop, Bell, Blanco, Bosque, Brazos, Burlison, Burnet, Caldwell, Coryell, Falls, Fayette, Freestone, Grimes, Hamilton, Hays, Hill, Lampasas, Lee, Leon, Limestone, Llano, Madison, McLennan, Milam, Mills, Robertson, San Saba, Travis, Washington, and Williamson) that is eligible to hold a license under 47 CFR 90.523 or 47 CFR 2.103. No single agency shall be allowed more than one member for each distinct eligibility category (e.g. police, fire, EMS, highway) within the agency’s organization or political jurisdiction. When voting on any issue, upon the specific request of any member, the voting members must identify themselves and the agency and eligibility category which they represent. Voting members may not vote on issues involving their entity.
  - B. Non-Voting Members. Non-voting members are all others interested in furthering the goals of public safety communications.
- 2.2 Tenure. Each member shall hold membership from the date of acceptance until resignation or removal.
- 2.3 Powers and Rights. In addition to such powers and rights as are vested in them by law, or by these bylaws, the members shall have such other powers and rights as the membership may determine from time to time.

- 2.4 Suspension and Removal. A member may be suspended or removed with cause by vote of a majority of members held at an annual, special, or regular meeting, after reasonable notice and an opportunity to be heard. Failure to attend 50% of meetings held in a calendar year, either in person or by proxy, shall be a specific cause for removal from the membership.
- 2.5 Resignation. A member may resign by delivering written resignation to any officer of the Regional Committee or to a meeting of the members.
- 2.6 Proxies. Voting members may vote either in person or by written proxy dated not more than one month before the meeting named therein, which proxies shall be filed with the secretary or other person responsible for recording the proceedings of the meeting. Unless otherwise specifically limited by their terms, such proxies shall entitle the holders thereof to vote at any adjournment of any meeting. The proxy shall terminate after the final adjournment of such meeting.

### ARTICLE III

#### MEETINGS

- 3.1 Annual Meetings. An annual meeting of the members shall be held at Austin, Texas, on the fifteenth day of October of each year, or if that date is a weekend or legal holiday in the place where the meeting is to be held, then on the next succeeding business day that is not a legal holiday. If an annual meeting is not held as herein provided, a special meeting of the members may be held in place thereof with the same force and effect as the annual meeting, and, in such case, all references in these bylaws, except in this Section 3.1, to the annual meeting of the members shall be deemed to refer to such special meeting. Any such special meeting shall be called and notice shall be given as provided in Sections 3.2 and 3.4.
- 3.2 Special Meetings. Special meetings of the members may be held at any time and at any place within the regional area. Special meetings of the members may be called by the chairman, or in case of death, absence, or incapacity, by any other officer, or upon written application to the secretary of two or more members.
- 3.3 Regular Meetings. Regular meetings of the committee shall be held periodically according to a schedule established in the Regional Plan. It is the prerogative of the Chairman to cancel any regular meeting at which there is no business to be conducted..
- 3.4 Call and Notice.
- A. Meetings. Reasonable notice of the time and place of annual, special, and regular meetings of the members shall be given to each member. Such notice must specify the purposes of the meeting.
  - B. Reasonable and sufficient notice. Except as otherwise expressly provided, it shall be reasonable and sufficient notice to a member to send notice by mail at least fifteen (15) business days, or by e-mail/facsimile at least ten (10) business days before the meeting, addressed to such member at his or her usual or last

known business address, or, to give notice to such member in person or by telephone at least ten (10) business days before the meeting.

- 3.5 Quorum. At any meeting of the members thirty (30) per cent of the voting members as of the close of the most previous Annual, Special, or Regular meeting shall constitute a quorum. Any meeting may be adjourned to such date or dates not more than ninety days after the first session of the meeting by a majority of the votes cast upon the question, whether or not a quorum is present, and the meeting may be held as adjourned without further notice.
- 3.6 Action by Vote. Each voting member shall have one vote; non-voting members have no right to vote. When a quorum is present at any meeting, a majority of the votes cast by the voting members present shall decide any question, including election to any office, unless otherwise provided by law or by these bylaws.
- 3.7 Action by Writing. Any action required or permitted to be taken at any meeting of the members may be taken without a meeting if all members entitled to vote on the matter consent to the action in writing and the written consents are filed with the records of the meetings of the members. Such consents shall be treated for all purposes as a vote at a meeting.

#### ARTICLE IV

##### OFFICERS AND AGENTS

- 4.1 Number and qualification. The officers of the Regional Committee shall be a chairman, treasurer, secretary and such other officers, if any, as the voting members may determine.
- 4.2 Election. The officers shall be elected by the voting members at the first meeting and, thereafter, at the annual meeting of the members.
- 4.3 Tenure. The officers shall each hold office until the annual meeting of the members held within a year from the adoption of these bylaws, or until their successor, if any, is chosen, or in each case until he or she sooner dies, resigns, is removed or becomes disqualified.
- 4.4 Chairman. The chairman shall be the chief executive officer of the Regional Committee and, subject to the control of the voting members, shall have general charge and supervision of the affairs of the Regional Committee. The chairman shall preside at all meetings of the Regional Committee.
- 4.5 Treasurer. The treasurer shall be the chief financial officer and the chief accounting officer of the Regional Committee. The treasurer shall be in charge of its financial affairs, funds, and valuable papers and shall keep full and accurate records thereof. The office of Treasurer may be combined with the office of Secretary.
- 4.6 Secretary. The secretary shall record and maintain records of all proceedings of the members in a file or series of files kept for that purpose, which file or files shall be kept within the Region and shall be open at all reasonable times to the inspection of any member. Such file or files shall also contain records of all meetings and the original, or attested copies, of bylaws and names of all members and the address (including e-mail address, if available) of each. If the secretary is absent from any meeting of members, a temporary secretary chosen at the meeting shall exercise the duties of the secretary at the meeting. The office of Secretary may be combined with the office of Treasurer.

- 4.7 Suspension or Removal. An officer may be suspended with cause by vote of a majority of the voting members.
- 4.8 Resignation. An officer may resign by delivering his or her written resignation to any other officer of the Regional Committee. Such resignation shall be effective upon receipt (unless specified to be effective at some other time), and acceptance thereof shall not be necessary to make it effective unless it so states.
- 4.9 Vacancies. If the office of any officer becomes vacant, the voting members may elect a successor. Each such successor shall hold office for the remainder terms, and in the case of the chairman, treasurer and secretary until his or her successor is elected and qualified, or in each case until he or she sooner dies, resigns, is removed or becomes disqualified.

## **ARTICLE V**

### **AMENDMENTS**

These bylaws may be altered, amended or repealed in whole or in part. The voting members may by a two-thirds vote, alter, amend, or repeal any bylaws adopted by the Regional Committee members or otherwise adopt, alter, amend or repeal any action taken by the voting members.

## **ARTICLE VI**

### **DISSOLUTION**

This Regional Committee may be dissolved by the vote of two-thirds plus one of the members in good standing at a special meeting called for such purpose. On dissolution, any assets remaining shall be distributed to one or more regularly organized and qualified charitable, educational, scientific or philanthropic organization(s) selected by those members in attendance at this special called meeting. The FCC shall be notified.

## **ARTICLE VII**

### **RULES OF PROCEDURES**

The Conduct of Regional Meetings including, without limitation, debate and voting, shall be governed by Robert's Rules of Order, newly revised 2000 edition, tenth edition, Henry M. Robert III, William J. Evans, Daniel H. Honeman, and Thomas J. Balch.

## Appendix B

### List of Region 49 Members

## Appendix D

### Region 49 Meeting Notices, Mailing Lists, Publication Verifications, Agendas, & Minutes

## Region 49 700 MHz Regional Planning Committee

Minutes of the October 31, 2001, meeting

**Item 1: Call to order:** Convener Ron Mayworm called the initial meeting of the Region 49, 700 MHz Regional Planning Committee (RPC) to order at 1:40 pm. The following members and guests were present:

Ron Mayworm, Convener  
Greg Petrey, Brazos County 9-1-1  
Dennis Wilson, Limestone Co. SO  
Don Ford, Limestone Co. Fire  
HD Whitaker, Freestone Co, SO  
Clinton Bushacker, Winchester VFD  
Ronnie Horcica, College Station PD  
Charles Keener, Burleson Co. FD  
Ken Biederman, Burleson Co. FD  
Art Sanders, M/A Com  
John Cochran, Luling PD  
Gary Young, Copperas Cove FD  
Michael Gallawy, Copperas Cove FD  
Jerry Newbury, TX DPS  
Ed Marchant, TX DPS  
Bill Davis, City of Austin FD  
Dan Richards, Travis Co. SO  
Linda Waso, Lee Co. SO  
Jim McClure, Brenham PD

Patrick Jacobs, Brenham PD  
Clint Meadows, Martindale PD  
Larry Blare, City of Waco PD  
Frank Coggins, Lockhart PD  
John Burton, Round Rock FD  
Walter Leslie, Travis Co. FD  
Sam Allen, Lockhart PD  
Dewayne Dalrymple, Lockhart PD  
Becky Stewart, CAPCO  
Brice Shelton, Motorola  
Andres Gutierrez, Jonestown PD  
Roger Thompson, Jonestown PD  
Robert Turner, City of Austin EMS  
Ken Yoder, APCO Freq. Coord.  
Daniel Law, Caldwell Co. SO  
Rodney Gott, Caldwell Co. SO  
Richard Herndon, TxDOT  
Mike Simpson, City of Austin

Convener Ron Mayworm introduced himself and explained the purpose of today's meeting. Mr. Mayworm also introduced Ken Yoder, APCO Frequency Coordinator and Becky Stewart, 3<sup>rd</sup> Vice president of the Texas Chapter of APCO.

**Item 2: Appointment of temporary secretary:** Mr. Mayworm appointed Greg Petrey temporary Secretary.

**Item 3: Presentation: 700 MHz basics:** Mr. Mayworm presented a Power Point presentation (attached to the original copy of these minutes) concerning the use, management and licensing of the 700 MHz spectrum. Mr. Mayworm reported that the FCC had directed the 821 MHz Chairman to appoint a Convener for the 700 MHz initial meeting. 800 MHz Chairman Ron Mayworm appointed himself as Convener. Mr. Mayworm also indicated that the FCC guidelines had been followed concerning the required 60 day notice of this meeting. The meeting notice was published in the *Austin American Statesman*, *Temple Daily Telegram*, *Waco Tribune/Herald* and the *Bryan/College Station Eagle*. In addition, direct mail notices were sent to over 600 entities in Central Texas. Mike Simpson asked if any other region besides Region 51 (Houston) had convened. Mr. Mayworm indicated that Region 49 was the second region to convene. Ken Yoder indicated that Region 53 would convene on November 13, 2001. Mr. Simpson asked for clarification that the Region 49 plan would only have to be "signed-off-on" by Region 51. Mr. Mayworm indicated that this was correct, and that this procedure had been verified with the FCC. Dan Richards asked if the current Region 49 committee could assume the responsibilities of the 700 MHz spectrum. Mr. Mayworm indicated that since the rules governing who can be licensed in the two bands are different that a new 700 MHz Committee will have to be formed. Mr. Mayworm conceded that the membership will probably be very similar, but they would have to be two separate committees. Dan Richards questioned if members would have to be approved by their governing body or if this committee is empowered to appoint members. Mr. Mayworm indicated that the planning committee can operate independently, based on FCC guidelines. Mike Simpson offered clarification that this planning committee was open to all entities in the 30 counties and would produce a regional plan. The new plan would outline who the members of the 700 MHz Regional Review Committee would be and how they would operate. Mr. Mayworm indicated that this was exactly the procedure. Mr. Simpson asked how long we had to produce a plan. Mr. Mayworm indicated that the FCC had set a deadline of three (3) years from the date the committee is convened. Mr. Mayworm indicated that he thought the plan could be completed much sooner than that, with a target date of one (1) year. Richard Herndon asked if there was a repository of information from other regions or mechanisms to receive that information. Mr. Mayworm indicated that he would research the availability of information and report back to the committee.

**Item 4: Financial Report:** Mr. Mayworm announced that the committee had received a grant for initial planning. Mr. Mayworm also announced that the Brazos County Emergency Communications District had agreed to be the grant manager. Our account balance as of October 13, 2003, is \$1,070.74. (A complete financial report is attached to the official minutes)

**Item 5: Elect Chairman:** Mr. Mayworm opened the floor for nominates for the office of Chairman. Jerry Newbury nominated Ron Mayworm. The motion was seconded by Dan Richards. Becky Stewart moved that nominations cease. Hearing no objections, Mr. Mayworm closed the nominations and accepted the Chairmanship.

Item 6: Consider/adopt proposed bylaws: Chairman Mayworm presented proposed interim bylaws for the committee. Mr. Mayworm noted that on the last page where Roberts rules of order is listed that a newer version is now available. Becky Stewart moved that the bylaws be approved as presented. Motioned was seconded by Ken Biederman. Mr. Simpson called a point of order for clarification of committee membership. Mr. Mayworm indicated that Police, Fire, EMS or Highway representatives were eligible for membership. Mr. Simpson asked that everyone identify what agency they were representing. Mr. Herndon asked if Mr. Mayworm could indicate where this document had been changed from the original. Mr. Mayworm provided detail on the changes. Mr. Herndon also asked about voting since multiple people may be representing the same agency. Mike Simpson also indicated that everyone needed to indicate what entity they were voting for. Chairman Mayworm asked the secretary to call the roll and have each person indicate what entity they are voting for. The roll was called and each person's entity was marked on the official sign in sheet [and noted above]. Dan Richards questioned the 10% quorum requirement and asked for discussion. Ron Mayworm indicated that that number would be a sliding percentage based on the attendance at the last meeting, not 10% of the eligible membership. Greg Petrey asked if section 2.1.a would not cap the membership at 120. Mr. Mayworm indicted that it would not because each fire department in the county for example would have a potential vote not just one vote for the county. General discussion was held concerning the dynamics of the group and how to determine membership. Dan Richards offered a friendly amendment to the motion to raise the quorum to 30%. Becky Stewart accepted the friendly amendment. Following discussion, Becky Stewart withdrew her original motion. Robert Turner moved that the by-laws be adopted as interim with the amendment to raise the required quorum to 30%. The motion was seconded by Ken Yoder and passed unanimously.

Break a 3:15 p.m.

The meeting was called back to order at 3:40 p.m.

**Item 7: Elect secretary and treasurer:** Chairman Mayworm requested nominations for the position of Secretary/Treasurer. Ken Yoder nominated Greg Petrey. Mike Simpson moved that nominations cease. Becky Stewart seconded the motion. Greg Petrey was elected Secretary/Treasurer by acclimation.

**Item 8: Establish subcommittees:** Chairman Mayworm appointed himself to the plan committee. Mr. Mayworm requested volunteers for this committee. Mr. Mayworm indicated that he was not going to appoint an interoperability subcommittee at this time. Greg

Petrey was appointed as chairman of the outreach committee. Ken Biederman was appointed as bylaws subcommittee chairman. Richard Herndon agreed to help on the by-laws committee.

**Item 9: Region 49 Listserv:** Chairman Mayworm advised those present about the Region 49 listserv on Yahoo.com. He requested all interested parties sign-up for the listserv.

**Item 10: Solicit hosts for future meetings:** Chairman Mayworm indicated that the FCC would like for these meetings to be held in various locations in the region. He asked for hosts for upcoming meetings.

The meeting was adjourned at 4:05 p.m.

Respectfully Submitted;



Greg Petrey, Secretary

**REGION 49 (CENTRAL TEXAS) PUBLIC SAFETY REGIONAL PLANNING AND  
REVIEW COMMITTEES ANNOUNCE**

**REGION 49 700 MHZ REGIONAL PLANNING COMMITTEE MEETING  
AND  
REGION 49 800 MHZ REGIONAL REVIEW COMMITTEE MEETING**

The Region 49 (Central Texas, includes the following counties: Bastrop, Bell, Blanco, Bosque, Brazos, Burlison, Burnet, Caldwell, Coryell, Falls, Fayette, Freestone, Grimes, Hamilton, Hays, Hill, Lampasas, Lee, Leon, Limestone, Llano, Madison, McLennan, Milam, Mills, Robertson, San Saba, Travis, Washington, and Williamson) Regional Planning and Review Committees announce two Region 49 Public Safety communications meetings.

## Region 49 700 MHz Plan – DRAFT 05/30/06

On Tuesday, December 30, 2003, the Region 49 700 MHz Regional Planning Committee will convene at 9:00 a.m. at the Texas Criminal Law Enforcement Auditorium, Building E, 6100 Guadalupe, Austin, Texas 78752.

The agenda for this meeting includes:

1. Review and approve agenda
2. Review and approve minutes of the October 29, 2001, meeting
3. Treasurer's Report – Greg Petrey
4. Subcommittee reports
  - a. Bylaws Subcommittee – Ron Mayworm
  - b. Plan Writing Subcommittee – Ron Mayworm
5. Discussion and possible action on adopting the interim bylaws as the permanent bylaws.
6. Update on the CAPRAD 700 MHz database – Ron Mayworm and Ken Yoder
7. Update on the Region 49 website and listserv – Greg Petrey
8. Review and discussion of the draft Region 49 700 MHz plan
9. An overview of the 50 MHz of spectrum allocated to public safety in the 4.9 GHz band
10. A review of FCC Docket 00-32 and the parameters outlined for agencies to operate in the 4.9 GHz band
11. A review of the FCC's requirement for a plan to be developed within 12 months by the 700 MHz Regional Planning Committee for implementation of the 4.9 GHz spectrum in the region
12. Discussion and possible action regarding the committee's intent to coordinate frequency assignments in the new 4.9 GHz public safety band.
13. Old business
14. New business
15. Receive public comments
16. Adjourn

The interim bylaws and draft Region 49 700 MHz plan will be posted on the Region 49 web site, [www.Region49.org](http://www.Region49.org), by November 15, 2003.

Please note that under the interim bylaws adopted on October 29, 2001, a quorum of at least 9 agencies' representatives must attend this meeting for business to be conducted.

On Tuesday, December 30, 2003, the Region 49 800 MHz Review Committee will convene at 3:00 p.m. at the Texas Criminal Law Enforcement Auditorium, Building E, 6100 Guadalupe, Austin, Texas 78752.

The agenda for this meeting includes:

1. Review and approve agenda
2. Review and approve minutes of the March 27, 2003 meeting
3. Consideration and possible action regarding the application of the City of Waco for mobile use of the 5 NPSPAC mutual aid channels

## Region 49 700 MHz Plan – DRAFT 05/30/06

4. Consideration and possible action regarding any other applications received by the Secretary more than 30 days prior to this meeting
5. Old business
6. New business
7. Receive public comments
8. Adjourn

Both the Region 49 700 MHz Regional Planning Committee and the Region 49 800 MHz Regional Review Committee meetings are open to the public. All eligible public safety providers whose sole purpose or principal purpose is to protect the safety of life, health, or property in the Central Texas area may utilize these frequencies. It is essential that not only public safety, but all government, Native American Tribal, and non-governmental organizations eligible under Section 90.523 of the Federal Communications Commission's Rules be represented in order to ensure that each agency's future spectrum needs are considered in the allocation process. Administrators who are not oriented in the communications field should delegate someone with this knowledge to attend, participate, and represent your agency's needs.

All interested parties wishing to participate in the planning for use of public safety spectrum in the 700 MHz, 800 MHz NPSPAC, or the new 4.9 GHz bands within Region 49 are encouraged to attend. For further information, please contact

Ron Mayworm, Chairman  
Region 49 700 MHz Regional Planning Committee  
P. O. Box 1585  
Bryan, TX 77806  
(979) 209-5475  
[ron@ktsignals.com](mailto:ron@ktsignals.com)

## Appendix E 700 MHz Interoperability Channels, Labels, and Usage

	12.5 kHz CHANNEL PAIR	CHANNEL LABEL (proposed)	RADIO SERVICE	TALK-AROUND	CHANNEL LABEL (proposed)	USE/MISC NOTES
01	Pair 23-24/983-984	<b>7TAC58</b>	General Public Safety Service (secondary trunked)	Channel 23-24	<b>7TAC58D</b>	
02	<b>Pair 39-40/999-1000</b>	<b>7CAL59</b>	<b>Calling Channel</b>	<b>Channel 39-40</b>	<b>7CAL59D</b>	<b>mandatory</b>
03	Pair 63-64/1023-1024	<b>7EMS60</b>	EMS	Channel 63-64	<b>7EMS60D</b>	
04	Pair 79-80/1039-1040	<b>7EMS61</b>	EMS	Channel 79-80	<b>7EMS61D</b>	
05	Pair 103-104/1063-1064	<b>7TAC62</b>	General Public Safety Service (secondary trunked)	Channel 103-104	<b>7TAC62D</b>	
06	Pair 119-120/1079-1080	<b>7TAC63</b>	General Public Safety Service	Channel 119-120	<b>7TAC63D</b>	<b>mandatory</b>
07	Pair 143-144/1103-1104	<b>7FIR64</b>	Fire	Channel 143-144	<b>7FIR64D</b>	
08	Pair 159-160/1119-1120	<b>7FIR65</b>	Fire	Channel 159-160	<b>7FIR65D</b>	
09	Pair 183-184/1143-1144	<b>7TAC66</b>	General Public Safety Service (secondary trunked)	Channel 183-184	<b>7TAC66D</b>	
10	Pair 199-200/1159-1160	<b>7TAC67</b>	General Public Safety Service	Channel 199-200	<b>7TAC67D</b>	
11	Pair 223-224/1183-1184	<b>7LAW68</b>	Police	Channel 223-224	<b>7LAW68D</b>	
12	Pair 239-240/1199-1200	<b>7LAW69</b>	Police	Channel 239-240	<b>7LAW69D</b>	
13	Pair 263-264/1223-1224	<b>7TAC70</b>	General Public Safety Service (secondary trunked)	Channel 263-264	<b>7TAC70D</b>	
14	Pair 279-280/1239-1240	<b>7DAT71</b>	Mobile Data	Channel 279-280	<b>7DAT71D</b>	
15	Pair 303-304/1263-1264	<b>7MOB72</b>	Mobile Repeater	Channel 303-304	<b>7MOB72D</b>	<b>mandatory</b>
16	Pair 319-320/1279-1280	<b>7TAC73</b>	Other Public Service	Channel 319-320	<b>7TAC73D</b>	<b>mandatory</b>

**Channels labeled as mandatory include both the mobile transmit and mobile receive (a total of 16 channels) for subscriber units only**

**700 MHz Interoperability Channels, Labels, and Usage (continued)**

	<b>12.5 kHz CHANNEL PAIR</b>	<b>CHANNEL LABEL</b>	<b>RADIO SERVICE</b>	<b>TALK-AROUND</b>	<b>CHANNEL LABEL</b>	<b>USE/MISC NOTES</b>
17	Pair 641-642/1601-1602	<b>7EMS76</b>	EMS	Channel 641-642	<b>7EMS76D</b>	
18	Pair 657-658/1617-1618	<b>7TAC74</b>	General Public Safety Service (secondary trunked)	Channel 657-658	<b>7TAC74D</b>	
19	<b>Pair 681-682/1641-1642</b>	<b>7CAL75</b>	<b>Calling Channel</b>	<b>Channel 681-682</b>	<b>7CAL75D</b>	<b>mandatory</b>
20	Pair 697-698/1657-1658	<b>7EMS77</b>	EMS	Channel 697-698	<b>7EMS77D</b>	
21	Pair 721-722/1681-1682	<b>7FIR80</b>	Fire	Channel 721-722	<b>7FIR80D</b>	
22	Pair 737-738/1697-1698	<b>7TAC78</b>	General Public Safety Service (secondary trunked)	Channel 737-738	<b>7TAC78D</b>	
23	Pair 761-762/1721-1722	<b>7TAC79</b>	General Public Safety Service	Channel 761-762	<b>7TAC79D</b>	<b>mandatory</b>
24	Pair 777-778/1737-1738	<b>7FIR81</b>	Fire	Channel 777-778	<b>7FIR81D</b>	
25	Pair 801-802/1761-1762	<b>7LAW84</b>	Police	Channel 801-802	<b>7LAW84D</b>	
26	Pair 817-818/1777-1778	<b>7TAC82</b>	General Public Safety Service (secondary trunked)	Channel 817-818	<b>7TAC82D</b>	
27	Pair 841-842/1801-1802	<b>7TAC83</b>	General Public Safety Service	Channel 841-842	<b>7TAC83D</b>	
28	Pair 857-858/1817-1818	<b>7LAW85</b>	Police	Channel 857-858	<b>7LAW85D</b>	
29	Pair 881-882/1841-1842	<b>7MOB88</b>	Mobile Repeater	Channel 881-882	<b>7MOB88D</b>	<b>mandatory</b>
30	Pair 897-898/1857-1858	<b>7TAC86</b>	General Public Safety Service (secondary trunked)	Channel 897-898	<b>7TAC86D</b>	
31	Pair 921-922/1881-1882	<b>7DAT87</b>	Mobile Data	Channel 921-922	<b>7DAT87D</b>	
32	Pair 937-938/1897-1898	<b>7TAC89</b>	Other Public Service	Channel 937-938	<b>7TAC89D</b>	<b>mandatory</b>

**Channels labeled as mandatory include both the mobile transmit and mobile receive (a total of 16 channels) for subscriber units only**

# Appendix F

## NCC 700 MHz Pre-Assignment Rules/Recommendations

### Introduction

This paper describes a process for coordinating the initial block assignments of 700 MHz channels before details of actual system deployments is available. In this initial phase, there is little actual knowledge of the specific equipment to be deployed and the exact antenna sites locations. As a result, a simple, high-level method is proposed to establish guidelines for frequency coordination. When actual systems are deployed, additional details will be known and the system designers will be required to select specific sites and supporting hardware to control interference.

The calculations and examples presented in this Appendix are specific to ANSI/TIA/EIA- 102 series (Project 25) standards, unless stated otherwise. General Use channels may employ other digital technologies. When evaluating interference potential involving other digital technologies, refer to the latest version of TIA Technical Services Bulletin TSB- 88.

### Overview

Assignments will be based on a defined service area for each applicant. This will normally be an area defined by geographical or political boundaries such as city, county or by a data file consisting of line segments creating a polygon that encloses the defined area. The service contour is normally allowed to extend slightly beyond the geo/political boundaries such that systems can be designed for maximum signal levels within the boundaries, or coverage area. Systems must also be designed to minimize signal levels outside their geo/political boundaries to avoid interference into the coverage area of other co-channel users.

For co-channel assignments, the 40 dB $\mu$  service contour will be allowed to extend beyond the defined service area by 3 to 5 miles, depending on the type of environment: urban, suburban or rural. The co-channel 5 dB $\mu$  interfering contour will be allowed to touch but not overlap the 40 dB $\mu$  service contour of the system being evaluated. All contours are (50,50).

For adjacent and alternate channels, the 60 dB $\mu$  interfering contour will be allowed to touch but not overlap the 40 dB $\mu$  service contour of the system being evaluated. All contours are (50,50).

### Discussion

Based upon the ERP/HAAT limitations referenced in 47CFR ¶90.541(a), the maximum field strength will be limited to 40 dB relative to 1 $\mu$ V/m (customarily denoted as 40 dB $\mu$ ). It is assumed that this limitation will be applied similar to the way it is applied in the 821-824/866-869 MHz band. That is, a 40 dB $\mu$  field strength can be deployed up to a defined distance beyond the edge of the service area, based on the size of the service area or type of applicant, i.e. city, county or statewide system. This is important that public safety systems have adequate margins for reliability within their service area in the presence of interference, including the potential for interference from CMRS infrastructure in adjacent bands.

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The value of 40 dBμV in the 700 MHz band corresponds to a signal of -92.7 dBm, received by a half-wavelength dipole (1/2) antenna. The thermal noise floor for a 6.25 kHz bandwidth receiver would be in the range of -126 dBm, so there is a margin of approximately 33 dB available for “noise limited” reliability. Figure 1 shows show the various interfering sources and how they accumulate to form a composite noise floor that can be used to determine the “reliability” or probability of achieving the desired performance in the presence of various interfering sources with differing characteristics.

If CMRS out-of-band emissions (OOBE) noise is allowed to be equal to the original thermal noise floor, there is a 3 dB reduction<sup>1</sup> in the available margin. This lowers the reliability and/or the channel performance of Public Safety systems. The left side of Figure 1 shows that the original 33 dB margin is reduced by 3 dB to only 30 dB available to determine “noise + CMRS OOBE limited” performance and reliability.

There are also different technologies with various channel bandwidths and different performance criteria. C/N in the range of 17 – 20 dB is required to achieve channel performance.

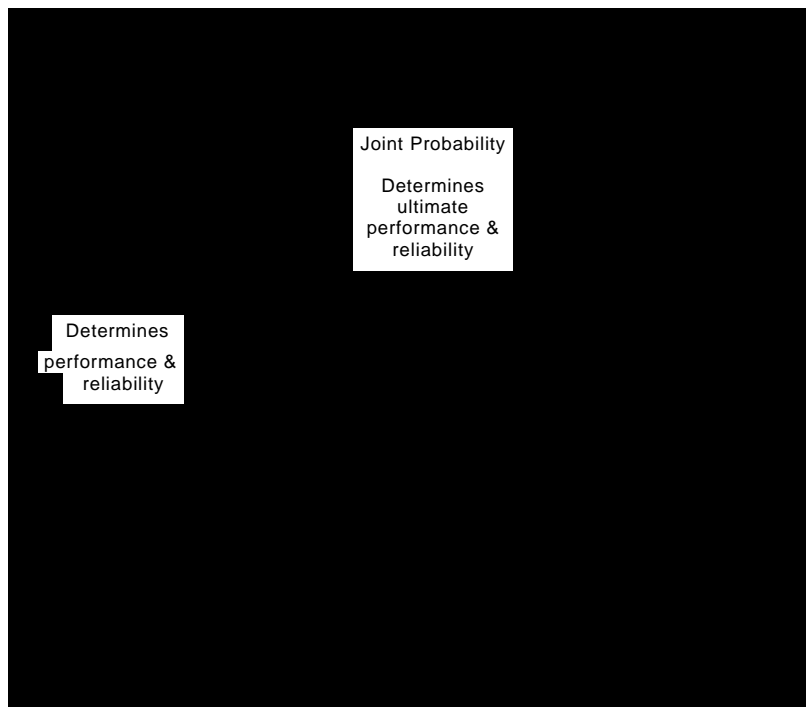


Figure 1 - Interfering Sources Create A “Noise” Level Influencing Reliability

In addition, unknown adjacent and alternate channel assignments need to be accounted for. The co-channel and adjacent/alternate sources are shown in the right hand side of Figure 1. At the edge of the service area, there would normally be only a single co-channel source, but there could potentially be several adjacent or alternate channel sources involved. It is recommended

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<sup>1</sup> TIA TR8 made this 3 dB allowance for CMRS OOBE noise during the meetings in Mesa, AZ, January 2001.

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that co-channel assignments limit interference to <1% at the edge of the service area (worst case mile). A C/I ratio of 26.4 dB plus the required capture value (~10 dB) is required to achieve this goal.<sup>2</sup>.

The ultimate performance and reliability has to take into consideration both the noise sources (thermal & CMRS OOB) and all the interference sources. The center of Figure 1 shows that the joint probability that the both performance criteria and interference criteria are met must be determined.

Table 1 shows estimated performance considering the 3 dB rise in the noise floor at the 40 dBμ signal level. Performance varies due to the different Cf/N requirements and noise floors of the different modulations and channel bandwidths.

Note that since little is known about the affects of terrain, an initial lognormal standard deviation of 8 dB is used.

<b>Comparison of Joint Reliability for various configurations</b>				
<b>configurations</b>	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver ENBW (kHz)	6	6	9	18
Noise Figure(10 dB)	10	10	10	10
Receiver Noise Floor (dBm)	-126.22	-126.22	-124.46	-121.45
Rise in Noise Floor (dB)	3.00	3.00	3.00	3.00
New Receiver Noise Floor (dB)	-123.22	-123.22	-121.46	-118.45
40 dBu = -92.7 dBm	-92.7	-92.7	-92.7	-92.7
Receiver Capture (dB)	10.0	10.0	10.0	10.0
Noise Margin (dB)	30.52	30.52	28.76	25.75
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
C/N Margin (dB)	<b>13.52</b>	<b>13.52</b>	<b>10.76</b>	<b>5.75</b>
Standard deviation (8 dB)	8.0	8.0	8.0	8.0
Z	1.690	1.690	1.345	0.718
Noise Reliability (%)	<b>95.45%</b>	<b>95.45%</b>	<b>91.06%</b>	<b>76.37%</b>
C/I for <1% prob of capture	36.4	36.4	36.4	36.4
I (dBu)	3.7	3.7	3.7	3.7
I (dBm)	-129.0	-129.0	-129.0	-129.0
Joint Probability (C & I)	<b>94.7%</b>	<b>94.7%</b>	<b>90.4%</b>	<b>76.1%</b>
40 dBu = -92.7 dBm @ 770 MHz				

Table 1 Joint Probability For Project 25, 700 MHz Equipment Configurations.

These values are appropriate for a mobile on the street, but are considerably short to provide reliable communications to portables inside buildings.

### Portable In-Building Coverage

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<sup>2</sup>See Attachment A for an explanation of how the 1% interference value is defined

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and derived.

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Most Public Safety communications systems, today, are designed for portable in-building<sup>3</sup> coverage and the requirement for >95 % reliable coverage. To analyze the impact of requiring portable in building coverage and designing to a 40 dBμ service contour, several scenarios are presented. The different scenarios involve a given separation from the desired sites. Whether simulcast or multi-cast is used in wide-area systems, the antenna sites must be placed near the service area boundary and directional antennas, directed into the service area, must be used. The impact of simulcast is included to show that the 40 dBμ service contour must be able to fall outside the edge of the service area in order to meet coverage requirements at the edge of the service area. From the analysis, recommendations are made on how far the 40 dBμ service contour should extend beyond the service area.

Table 2 estimates urban coverage where simulcast is required to achieve the desired portable in building coverage. Several assumptions are required to use this estimate.

- Distance from the location to each site. Equal distance is assumed.
- CMRS noise is reduced when entering buildings. This is not a guarantee as the type of deployments is unknown. It is possible that CMRS units may have transmitters inside buildings. This could be potentially a large contributor unless the CMRS OOB is suppressed to TIA's most recent recommendation and the "site isolation" is maintained at 65 dB minimum.
- The 40 dBμ service contour is allowed to extend beyond the edge of the service area boundary.
- Other configurations may be deployed utilizing additional sites, lower tower heights, lower ERP and shorter site separations.

Estimated Performance at 2.5 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 2.5 miles (dBm)	-72.7	-72.7	-72.7	-72.7
Margin (dB)	53.50	53.50	51.80	45.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	20	20	20	20
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20
Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	<b>85.60%</b>	<b>85.60%</b>	<b>76.58%</b>	<b>39.17%</b>
Simulcast with 2 sites	97.93%	97.93%	94.5 1%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.7 1%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

Table 2, Estimated Performance From Site(s) 2.5 Miles From Typical Urban Buildings.

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<sup>3</sup>Building penetration losses typically required for urban = 20 dB, suburban = 15 dB,

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# Region 49 700 MHz Plan – DRAFT 05/30/06

rural = 10 dB.

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Table 2 shows for the example case of 2.5 miles that a single site cannot provide >95% reliability. Either more sites must be used to reduce the distance, or other system design techniques must be used to improve the reliability. For example, the table shows that simulcast can be used to achieve public safety levels of reliability at this distance. Table 2 also shows that the difference in performance margin requirements for wider bandwidth channels requires more sites and closer site-to-site separation.

Figures 2 and 3 show how the configurations would potentially be deployed for a typical site with 240 Watts ERP. This is based on:

- |                                    |                 |
|------------------------------------|-----------------|
| · 75 Watt transmitter,             | 18.75 dBW       |
| · 200 foot tower                   |                 |
| · 10 dBd 180 degree sector antenna | +10.0 dBd       |
| · 5 dB of cable/filter loss.       | <u>- 5.0 dB</u> |

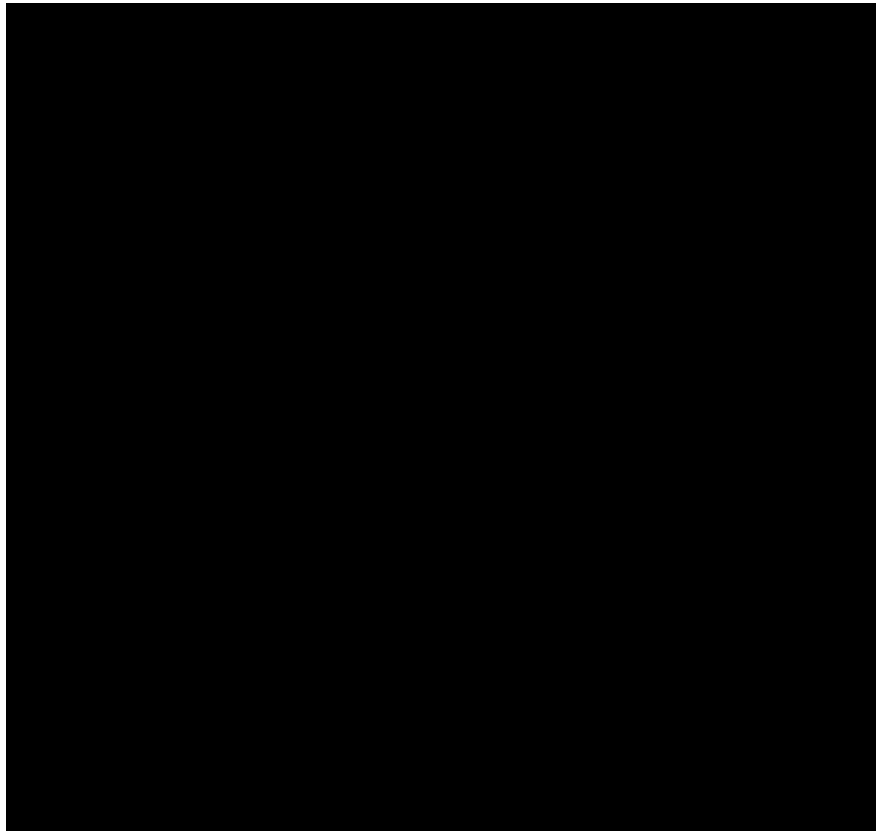


Figure 2 - Field Strength From Left Most Site.

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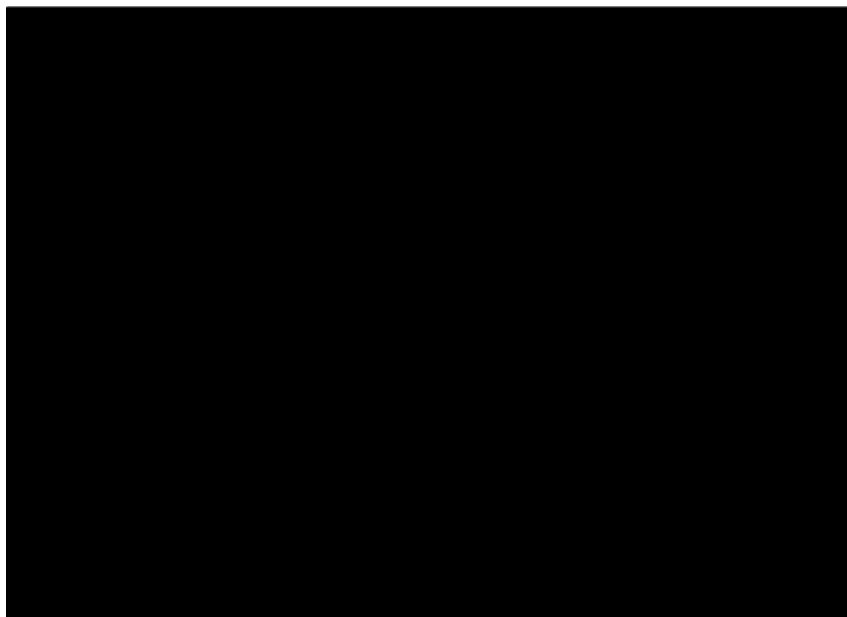


Figure 3 - Antenna Configuration Required To Limit Field Strength Off “Backside”

Figure 2 is for an urbanized area with a jurisdiction defined as a 5 mile circle. To provide the necessary coverage to portables in buildings at the center of the jurisdiction requires that the sites be placed along the edge of the service area and utilize directional antennas oriented toward the center of the service area (Figure 3). In this case, at 5 miles beyond the edge of the service area, the sites would produce a composite field strength of approximately 40 dB $\mu$ . Since one site is over 10 dB dominant, the contribution from the other site is not considered. The control of the field strength behind the site relies on a 20 dB antenna with a Front to Back Ratio (F/B) specification as shown in Figure 3. This performance may be optimistic due to back scatter off local obstructions in urbanized areas. However, use of antennas on the sides of buildings can assist in achieving better F/B ratios and the initial planning is not precise enough to prohibit using the full 20 dB.

The use of a single site at the center of the service area is not normally practical. To provide the necessary signal strength at the edge of the service area would produce a field strength 5 miles beyond in excess of 44 dB $\mu$ . However, if the high loss buildings were concentrated at the service area’s center, then potentially a single site could be deployed, assuming that the building loss sufficiently decreases near the edge of the service area allowing a reduction in ERP to achieve the desired reliability.

Instead of directional antennas, downtilting of antennas to control the 40 dB $\mu$  is not practical in this scenario. For a 200 foot tall tower, the center of radiation from a 3 degree downtilt antenna hits the ground at ~ 0.75 miles<sup>4</sup>. The difference in angular discrimination from a 200 foot tall tower at service area boundary at 5 miles and service contour at 10 miles is approximately 0.6 degrees, so ERP is basically the same as ERP toward the horizon. It would not be possible to

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<sup>4</sup>Use of high gain antennas with down-tilt on low-level sites is one of the causes of far-near interference experienced in the 800 MHz band.

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achieve necessary signal strength at service area boundary and have 40 dB $\mu$  service contour be less than 5 miles away.

Tables 3 and 4 represent the same configuration, but for less dense buildings. In these cases, the distance to extend the 40 dB $\mu$  service contour can be determined from Table 5.

Estimated Performance at 3.5 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 3.5 miles (dBm)	-77.7	-77.7	-77.7	-77.7
Margin (dB)	48.50	48.50	46.80	40.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	15	15	15	15
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20
Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	<b>85.60%</b>	<b>85.60%</b>	<b>76.58%</b>	<b>39.17%</b>
Simulcast with 2 sites	97.93%	97.93%	94.51%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.71%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

Table 3 - Lower Loss Buildings, 3.5 Mile From Site(s)

Estimated Performance at 5.0 miles from each site				
Channel Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	25.0 kHz
Receiver Noise Floor (dBm)	-126.20	-126.20	-124.50	-118.50
Signal at 5.0 miles (dBm)	-82.7	-82.7	-82.7	-82.7
Margin (dB)	43.50	43.50	41.80	35.80
C/N Required for DAQ = 3	17.0	17.0	18.0	20.0
Building Loss (dB)	10	10	10	10
Antenna Loss (dBd)	8	8	8	8
Reliability Margin	8.50	8.50	5.80	-2.20
Z	1.0625	1.0625	0.725	-0.275
Single Site Noise Reliability (%)	<b>85.60%</b>	<b>85.60%</b>	<b>76.58%</b>	<b>39.17%</b>
Simulcast with 2 sites	97.93%	97.93%	94.51%	62.99%
Simulcast with 3 sites	99.70%	99.70%	98.71%	77.49%
Simulcast with 4 sites	99.96%	99.96%	99.70%	86.30%

Table 4 - Low Loss Buildings, 5.0 Miles From Site(s)

Note that the receive signals were adjusted to offset the lowered building penetration loss. This produces the same numerical reliability results, but allows increasing the site to building separation and this in turn lowers the magnitude of the “overshoot” across the service area.

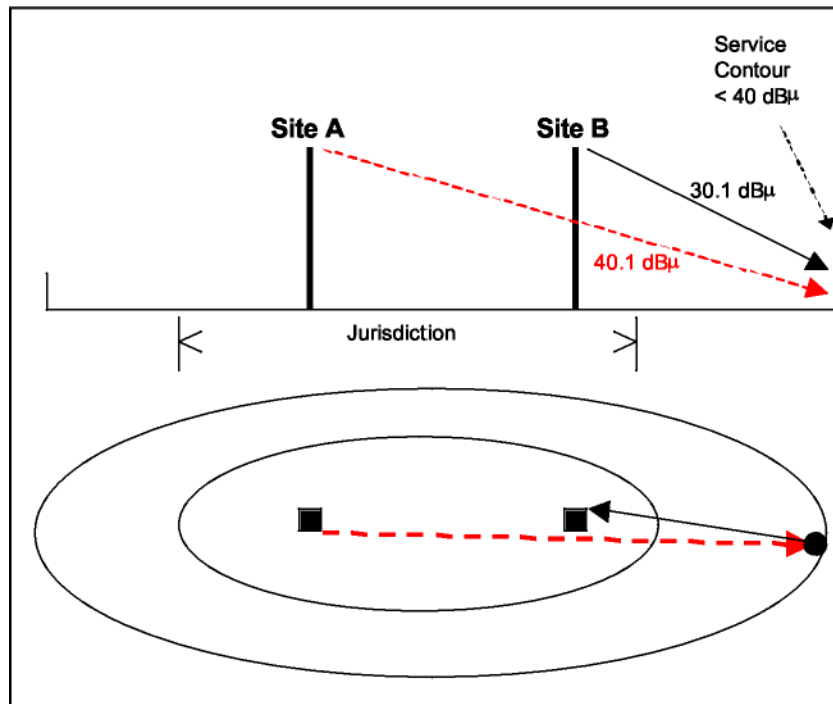
Table 5 shows the field strength for a direct path and for a path reduced by a 20 dB F/B antenna. This allows the analysis to be simplified for the specific example being discussed.

	Site A Direct Path	Site B Back Side of 20 dB F/B Antenna
Overshoot Distance (mi)	Field Strength (dBμ)	Field Strength (dBμ)
1	73.3	53.3
2	63.3	43.3
2.5	60.1	40.1
3	57.5	37.5
<b>4</b>	53.3	<b>33.5</b>
5	50.1	30.1
...	...	
10	40.1	
<b>11</b>	<b>38.4</b>	
12	37.5	
13	36.0	
14	34.5	
15	33.0	

Table 5 - Field Strength Vs. Distance From Site

For the scenarios above, the composite level at the Service Contour is the sum of the signals from the two sites. The sum can not exceed 40 dBμ. Table 5 allows you to calculate the distance to Service Contour given the distance from one of the sites.

Scenario 1: Refer to Figure 3a. Site B is just inside the Service Area boundary and Service Contour must be <5 Miles outside Service Area boundary. Signal level at Service Contour from Site B is 30.1 dBμ. Signal level for Site A can be up to 40 dBμ, since when summing two signals with >10 dB delta, the lower signal level has little effect (less than 0.4 dB in this case). Therefore, Site A can be 10 miles from the Service Contour, or 5 miles inside the Service Area boundary. The coverage performance for this scenario is shown in Table 2, above, for 20 dB building loss typical of urban areas.



**Figure 3a. Scenario 1 on Use of Table 5**

Scenario 2: Refer to bold data in Table 5. Site B is just inside the Service Area boundary and Service Contour must be <4 Miles outside Service Area boundary. Signal level at Service Contour from Site B is 33.5 dB $\mu$ . Signal level for Site A can be up to 38.4 dB $\mu$ . (See Attachment B for simple method to sum the powers of signals expressed in decibels.) The composite power level is 39.7 dB $\mu$ . Therefore, Site A can be slightly less than 11 miles from the Service Contour, or ~7 miles inside the Service Area boundary. The coverage performance for this example is shown in Table 3, above, for 15 dB building loss typical of suburban areas.

Scenario 3: Site B is just inside the Service Area boundary and Service Contour must be <3 Miles outside Service Area boundary. Signal level at Service Contour from Site B is 37.5 dB $\mu$ . Signal level for Site A can be up to 36.4 dB $\mu$ . (See Attachment B simple method to sum signals expressed in decibels.) The composite power level is 40.0 dB $\mu$ . Therefore, Site A can be ~1 3 miles from the Service Contour, or ~10 miles inside the Service Area boundary. The coverage performance for this example is shown in Table 4, above, for 10 dB building loss typical of rural areas.

**Service Contour Extension Recommendation**

The resulting recommendation for extending the 40 dB $\mu$  service contour beyond the service area boundary is:

Type of Area	Extension (mi.)
Urban (20 dB Buildings)	5
Suburban (15 dB Buildings)	4
Rural (10 dB Buildings)	3

Table 6 - Recommended Extension Distance Of 40 dB $\mu$  Field Strength

Using this recommendation, the 40 dB $\mu$  service contour can then be constructed based on the defined service area without having to perform an actual prediction.

**Interfering Contour**

Table 1 above shows that 36.4 dB of margin is required to provide 10 dB of co-channel capture and <1% probability of interference. Since the 40 dB $\mu$  service contour is beyond the edge of the service area, some relaxation in the level of interference is reasonable. Therefore, a 35 dB co-channel C/I ratio is recommended and is consistent with what is currently being licensed in the 821-824/866-869 MHz Public Safety band.

**Co-Channel Interfering Contour Recommendation**

- Allow the constructed 40 dB $\mu$  (50,50) service contour to extend beyond the edge of the defined service area by the distance indicated in Table 6.
  - Allow the 5 dB $\mu$  (5 0,50) interfering contour to intercept but not overlap the 40 dB $\mu$  service contour.
-

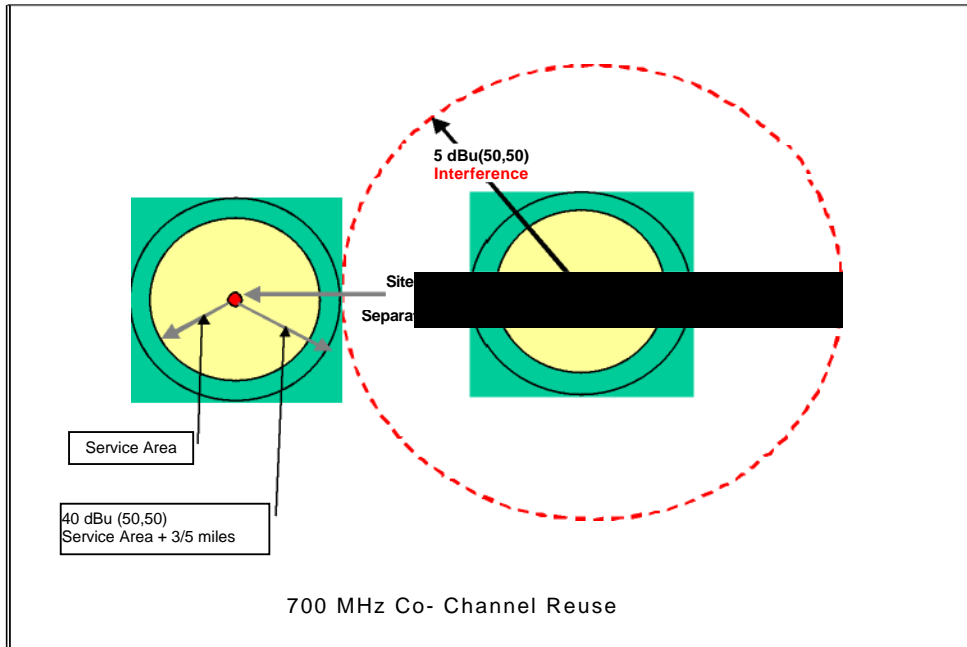


Figure 4 - Co-Channel Reuse Criterion

### Adjacent and Alternate Channel Considerations

Adjacent and alternate channels are treated as being noise sources that alter the composite noise floor of a victim receiver. Using the 47 CFR §90.543 values of ACCP can facilitate the coordination of adjacent and alternate channels. The C/I requirements for <1% interference can be reduced by the value of ACCPR. For example to achieve an X dB C/I for the adjacent channel that is -40 dBc a C/I of [X-40] dB is required. Where the alternate channel ACP value is -60 dBc, then the C/I = [X-60] dB is the goal for assignment(s). There is a compounding of interference energy, as there are numerous sources, i.e. co channel, adjacent channels and alternate channels plus the noise from CMRS OOB.

There is insufficient information in 47 CFR §90.543 to include the actual receiver performance. Receivers typically have “skirts” that allow energy outside the bandwidth of interest to be received. In addition, the FCC defines ACCP differently than does the TIA. The term used by the FCC is the same as the TIA definition of ACP. The subtle difference is that ACCP defines the energy intercepted by a defined receiver filter (e.g., 6 kHz ENBW). ACP defines the energy in a measured bandwidth that is typically wider than the receiver (e.g., 6.25 kHz channel bandwidth). As a result, the FCC values are optimistic at very close spacing and somewhat pessimistic at wider spacings, as the typical receiver filter is less than the channel bandwidth.

In addition, as channel bandwidth is increased, the total amount of noise intercepted rises compared to the level initially defined in a 6.25 kHz channel bandwidth. However, the effect is diminished at very close spacings as the slope of the noise curve falls off rapidly. At greater spacings, the slope of the noise curve is essentially flat and the receiver’s filter limits the noise to a rise in the thermal noise floor.

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Digital receivers tend to be less tolerant to interference than analog. Therefore, a 3 dB reduction in the C/(I+N) can reduce a DAQ = 3 to a DAQ = 2, which is threshold to complete muting in digital receivers. Therefore to maintain a DAQ = 3, at least 17 dB of fading margin plus the 26.4 dB margin for keeping the interference below 1% probability is required, for a total margin of 43.4 dB. However, this margin would be at the edge of the service area and the 40 dBμ service contour is allowed to extend past the edge of the service area.

Frequency drift is controlled by the FCC requirement for 0.4-ppm stability when locked. This equates to approximately a 1 dB standard deviation, which is negligible when associated with the recommended initial lognormal standard deviation of 8 dB and can be ignored.

The ANSI/TIA/EIA- 102 series (Project 25) standards require that a transceiver receiver have an ACIPR of 60 dB. This implies that an ACCPR <sup>3</sup> 65 dB will exist for a “companion receiver”. A companion receiver is one that is designed for the specific modulation. At this time the highest likelihood is that receivers will be deploying the following receiver bandwidths at the following channel bandwidths. Note that these calculations apply only to interference between systems built to Project 25 standards. General Use channels may employ other digital technologies.

Estimated Receiver Parameters	
Channel Bandwidth	Receiver Bandwidth
6.25 kHz	5.5 kHz
12.5 kHz	5.5 or 9 kHz
25 kHz	18.0 kHz

Table 7 - Estimated Receiver Parameters

Based on 47 CFR ¶90.543 and the P25 requirement for an ACCPR <sup>3</sup> 65 dB into a 6.0 kHz channel bandwidth and leaving room for a migration from Phase 1 to Phase 2, allows for making the simplifying assumption that 65 dB ACCPR is available for both adjacent 25 kHz spectrum blocks.

The assumption is that initial spectrum coordination sorts are based on 25 kHz bandwidth channels. This provides the maximum flexibility by using 65 dB ACCPR for all but one possible combination of 6.25 kHz channels within the 25 kHz allotment.

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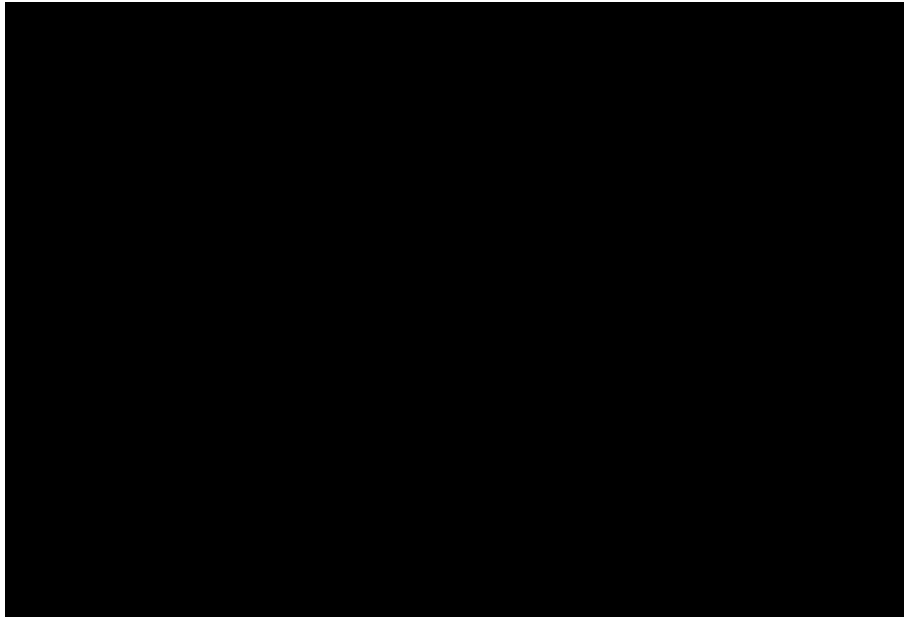


Figure 5, Potential Frequency Separations

Case	Spacing	ACCPR
25 kHz to 25 kHz	25 kHz	65 dB
25 kHz to 12.5 kHz	18.725 kHz	65 dB
25 kHz to 6.25 kHz	15.625 kHz	>40 dB
12.5 kHz to 12.5 kHz	12.5 kHz	65 dB
12.5 kHz to 6.25 kHz	9.375 kHz	>40 dB
6.25 kHz to 6.25 kHz	6.25 kHz	65 dB

Table 8 - ACCPR Values For Potential Frequency Separations

All cases meet or exceed the FCC requirement. The most troublesome cases occur where the wider bandwidths are working against a Project 25 Phase 2 narrowband 6.25 kHz channel. This pre- coordination based upon 25 kHz spectrum blocks still works if system designers and frequency coordinators keep this consideration in mind and move the edge 6.25 kHz channels inward away from the edge of the system. This approach allows a constant value of 65 dB ACCPR to be applied across all 25 kHz spectrum blocks regardless of what channel bandwidth is eventually deployed. There will also be additional coordination adjustments when exact system design details and antenna sites are known.

For spectrum blocks spaced farther away, it must be assumed that transmitter filtering, in addition to transmitter performance improvements due to greater frequency separation, will further reduce the ACCPR.

Therefore it is recommended that a consistent value of 65 dB ACCPR be used for the initial coordination of adjacent 25 kHz channel blocks. Rounding to be conservative due to the possibility of multiple sources allows the Adjacent Channel Interfering Contour to be approximately 20 dB above the 40 dBμ service contour, at 60 dBμ.

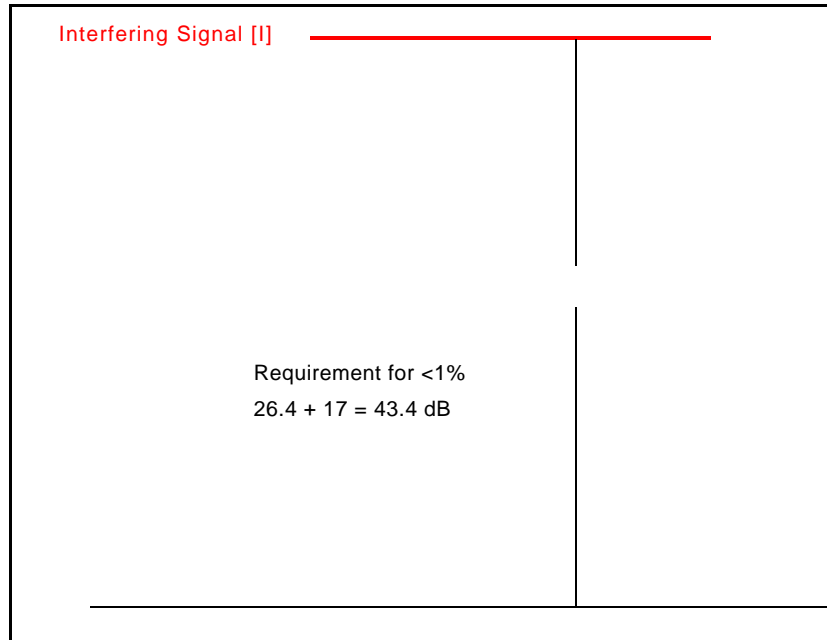


Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value

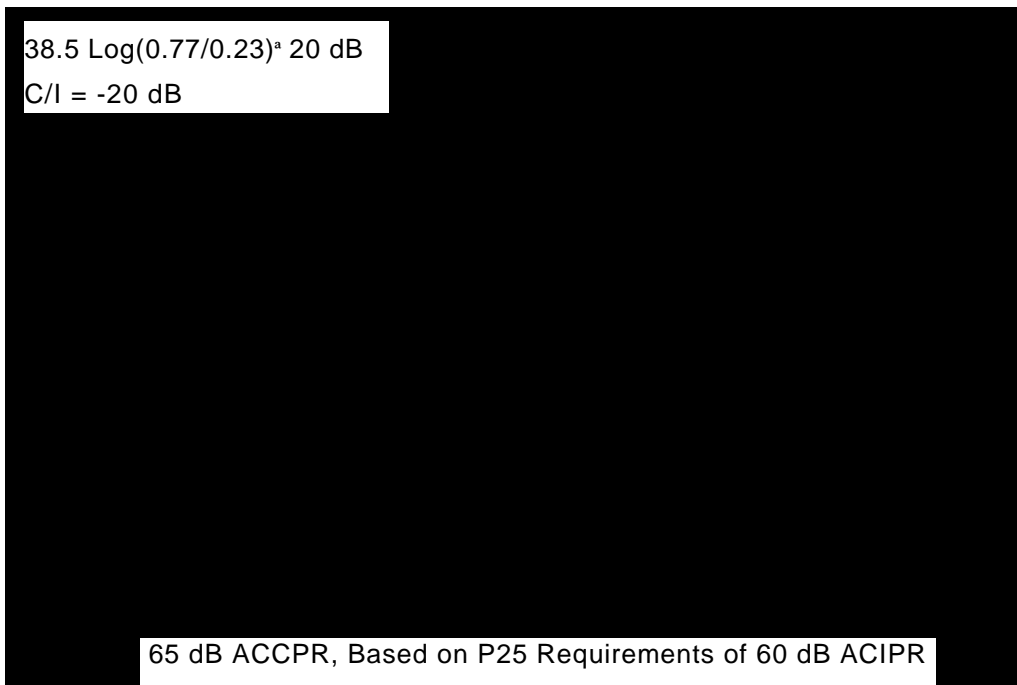


Figure 7 - Example Of Adjacent/Alternate Overlap Criterion

### **Adjacent Channel Interfering Contour Recommendation**

An adjacent (25 kHz) channel shall be allowed to have its 60 dB $\mu$  (50,50) interfering contour touch but not overlap the 40 dB $\mu$  (50,50) service contour of a system being evaluated. Evaluations should be made in both directions.

### **Final Detailed Coordination**

This simple method is only adequate for presorting large blocks of spectrum to potential entities. A more detailed analysis should be executed in the actual design phase to take all the issues into consideration.

Additional factors that should be considered include:

- Degree of Service Area Overlap
- Different size of Service Areas
- Different ERPs and HAATs
- Actual Terrain and Land Usage
- Differing User Reliability Requirements
- Migration from Project 25 Phase 1 to Phase 2
- Actual ACCP
- Balanced Systems
- Mobiles vs. Portables
- Use of voting
- Use of simulcast
- Radio specifications
- Simplex Operation
- Future unidentified requirements

Special attention needs to be paid to the use of simplex operation. In this case, an interferer can be on an offset adjacent channel and in extremely close proximity to the victim receiver. This is especially critical in public safety where simplex operations are frequently used at a fire scene or during police operation. This type operation is also quite common in the lower frequency bands. In those cases, evaluation of base-to-base as well as mobile-to-mobile interference should be considered and evaluated.

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**Attachment A**

**Carrier to Interference Requirements**

There are two different ways that Interference is considered.

- Co Channel
- Adjacent and Alternate Channels

Both involve using a C/I ratio. The C/I ratio requires a probability be assigned. For example, if 10% Interference is specified, the C/I implies 90% probability of successfully achieving the desired ratio. 1% interference means that there is a 99% probability of achieving the desired C/I.

$$C/I \text{ margin} = \frac{1}{2} \operatorname{erfc}^{-1} \left( \frac{I}{C} \right) \cdot \sigma$$

This can also be written in a form using the standard deviate unit (Z). In this case the Z for the desired probability of achieving the C/I is entered. For example, for a 90% probability of achieving the necessary C/I, Z = 1.28.

$$C/I \text{ margin} = Z \cdot \sigma$$

The most common requirements for several typical lognormal standard deviations (?) are included in the following table based on Equation (2).

Location Standard Deviation (σ) dB	5.6	6.5	8	10
Probability %				
10%	10.14 dB	11.77 dB	14.48 dB	18.10 dB
5%	13.07 dB	15.17 dB	18.67 dB	23.33 dB
4%	13.86 dB	16.09 dB	19.81 dB	24.76 dB
3%	14.90 dB	17.29 dB	21.28 dB	26.20 dB
2%	16.27 dB	18.88 dB	23.24 dB	29.04 dB
1%	18.45 dB	21.42 dB	<b>26.36 dB</b>	32.95 dB

Table A1 - Probability Of Not Achieving C/I For Various Location Lognormal Standard Deviations

These various relationships are shown in Figure A1, a continuous plot of equation(s) 1 and 2.

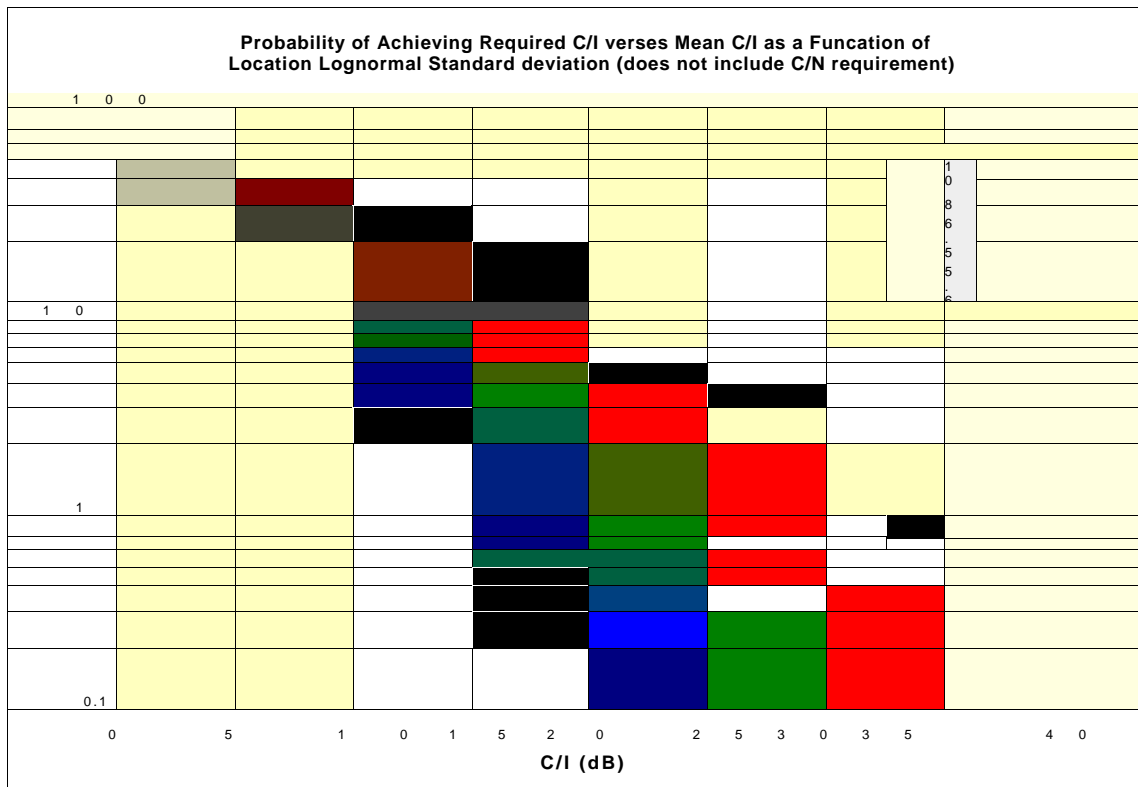


Figure A1, Probability Of Achieving Required C/I As A Function Of Location Standard Deviation

For co-channel the margin needs to include the “capture” requirement. When this is done, then a 1% probability of co channel interference can be rephrased to mean, there is a 99% probability that the “capture ratio” will be achieved. The capture ratio varies with the type of modulation. Older analog equipment has a capture ratio of approximately 7 dB. Project 25 FDMA is specified at 9 dB. Figure A1 shows the C/I requirement without including the capture requirement.

The 8 dB value for lognormal location standard deviation is reasonable when little information is available. Later when a detailed design is required, additional details and high-resolution terrain and land usage databases will allow a lower value to be used. The TIA recommended value is

5.6 dB. Using 8 dB initially and changing to 5.6 dB provides additional flexibility necessary to complete the final system design.

To determine the desired probability that both the C/N and C/I will be achieved requires that a joint probability be determined. Figure A2 shows the effects of a family of various levels of C/N reliability and the joint probability (Y-axis) in the presence of various probabilities of Interference. Note that at 99% reliability with 1% interference (X-axis) that the reduction is nearly the difference. This is because the very high noise reliability is degraded by the interference, as there is little probability that the noise criterion will not be satisfied. At 90%, the 1% interference has a greater likelihood that it will occur simultaneously when the noise criterion not being met, resulting in less degradation of the 90%.

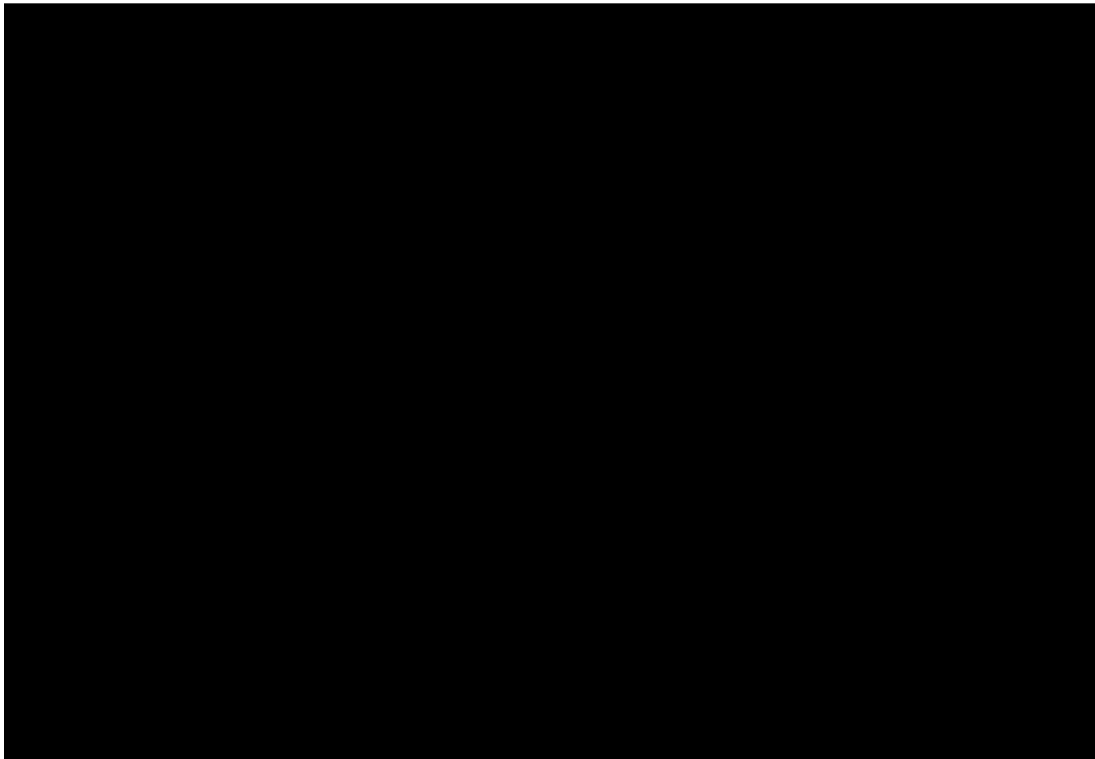


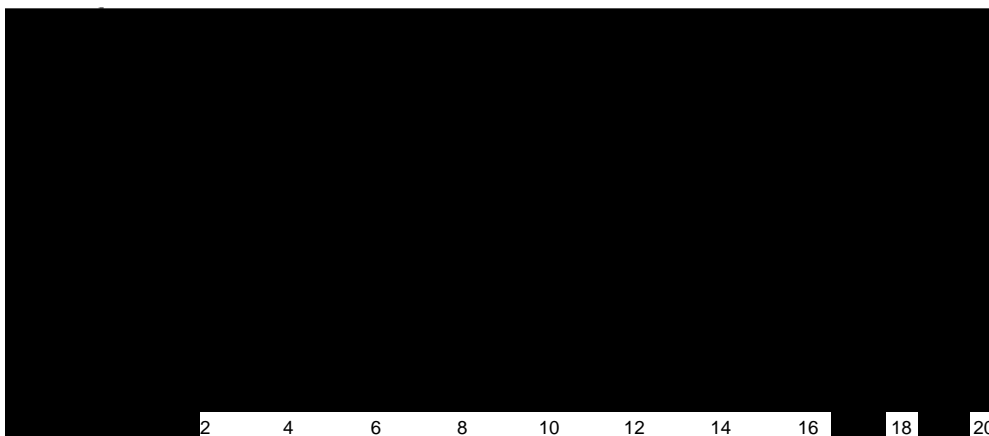
Figure A2 - Effect Of Joint Probability On The Composite Probability

For adjacent and alternate channels, the channel performance requirement must be added to the C/I ratio. When this is applied, then a 1% probability of adjacent/alternate channel interference can be rephrased to mean, there is a 99% probability that the “channel performance ratio” will be achieved.

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**Attachment B**

**Adding Two Known Non-Coherent Powers**



**Difference between two known powers (dB)**

In order to sum the power of two or more signals expressed in dBm or dBμ, the level should be converted to a voltage level or a power level, summed (root of the sum of the squares), and then converted back to dBm or dBμ.

The chart above provides simple method to sum two power levels expressed in dBm or dBμ. First find the difference between the two signals on the horizontal axis. Go up to the curve and across to the vertical axis to find the power delta. Add the power delta to the larger of the two original signal levels.

Example 1: Signal A is 36.4 dBμ. Signal B is 37.5 dBμ. Difference is 1.1 dB. Power delta is about 2.5 dB. Composite signal level is 37.5 dBμ + 2.5 dB = 40 dBμ.

Example 2: Signal is -96.3 dBm. Signal B is -95.2 dBm. Difference is 1.1 dB. Power delta is about 2.5 dB. Composite signal level is -95.2 dBm + 2.5 dB = -92.7 dBm.

## Appendix G

**The Region 49 Channel allocations have been established by the National Public Safety Telecommunications Council’s channel packing program. Region 49 anticipates an open filing window where applicants can apply for available channels in their county area. A “County Area” is defined as an area consisting of the area within the county as well as a distance of up to 10 miles outside of the county. It is anticipated this extended county area will enable Region 49 to maximize channel re-use of any “orphan” remainders.**

**REGION 49 700 MHZ CHANNEL ALLOTMENTS BY CHANNEL**

**Allotments by FCC Channel**

<b>FCC Channel Notation</b>	<b>Bandwidth</b>	<b>Mobile Frequency</b>	<b>Base Frequency</b>	<b>County</b>
13-16	25.00 KHz	794.087500 MHz	764.087500 MHz	Brazos Travis
17-20	25.00 KHz	794.112500 MHz	764.112500 MHz	Bell
41-44	25.00 KHz	794.262500 MHz	764.262500 MHz	Coryell Robertson
45-48	25.00 KHz	794.287500 MHz	764.287500 MHz	Hill Williamson
49-52	25.00 KHz	794.312500 MHz	764.312500 MHz	Fayette Freestone

53-56	25.00 KHz	794.337500 MHz	764.337500 MHz	Lampasas McLennan Travis
57-60	25.00 KHz	794.362500 MHz	764.362500 MHz	Brazos Llano
81-84	25.00 KHz	794.512500 MHz	764.512500 MHz	Bastrop Hamilton Limestone
85-88	25.00 KHz	794.537500 MHz	764.537500 MHz	Bell
89-92	25.00 KHz	794.562500 MHz	764.562500 MHz	Fayette Freestone
93-96	25.00 KHz	794.587500 MHz	764.587500 MHz	Falls Travis
97-100	25.00 KHz	794.612500 MHz	764.612500 MHz	Coryell Washington
121-124	25.00 KHz	794.762500 MHz	764.762500 MHz	Leon Williamson
125-128	25.00 KHz	794.787500 MHz	764.787500 MHz	McLennan
129-132	25.00 KHz	794.812500 MHz	764.812500 MHz	Brazos Hamilton Hays
133-136	25.00 KHz	794.837500 MHz	764.837500 MHz	Bell Fayette
137-140	25.00 KHz	794.862500 MHz	764.862500 MHz	Bosque Travis
161-164	25.00 KHz	795.012500 MHz	765.012500 MHz	Bastrop Burnet Robertson
165-168	25.00 KHz	795.037500 MHz	765.037500 MHz	Hill
169-172	25.00 KHz	795.062500 MHz	765.062500 MHz	Williamson
173-176	25.00 KHz	795.087500 MHz	765.087500 MHz	Burleson Hamilton Llano
177-180	25.00 KHz	795.112500 MHz	765.112500 MHz	McLennan Travis
201-204	25.00 KHz	795.262500 MHz	765.262500 MHz	Bastrop Blanco Limestone
205-208	25.00 KHz	795.287500 MHz	765.287500 MHz	Bell
209-212	25.00 KHz	795.312500 MHz	765.312500 MHz	Brazos Hays
213-216	25.00 KHz	795.337500 MHz	765.337500 MHz	Fayette Lampasas
217-220	25.00 KHz	795.362500 MHz	765.362500 MHz	Grimes McLennan Travis
241-244	25.00 KHz	795.512500 MHz	765.512500 MHz	Williamson
245-248	25.00 KHz	795.537500 MHz	765.537500 MHz	Bosque Llano Robertson
249-252	25.00 KHz	795.562500 MHz	765.562500 MHz	Bell Caldwell
253-256	25.00 KHz	795.587500 MHz	765.587500 MHz	Brazos Hamilton
257-260	25.00 KHz	795.612500 MHz	765.612500 MHz	McLennan Travis

281-284	25.00 KHz	795.762500 MHz	765.762500 MHz	Coryell Hays Leon
285-288	25.00 KHz	795.787500 MHz	765.787500 MHz	Falls Llano Washington
289-292	25.00 KHz	795.812500 MHz	765.812500 MHz	Williamson
293-296	25.00 KHz	795.837500 MHz	765.837500 MHz	Fayette Lampasas
297-300	25.00 KHz	795.862500 MHz	765.862500 MHz	Brazos McLennan Travis
321-324	25.00 KHz	796.012500 MHz	766.012500 MHz	Bastrop Blanco Hill Leon
325-328	25.00 KHz	796.037500 MHz	766.037500 MHz	Falls
329-332	25.00 KHz	796.062500 MHz	766.062500 MHz	Freestone Mills
333-336	25.00 KHz	796.087500 MHz	766.087500 MHz	Bell Fayette
337-340	25.00 KHz	796.112500 MHz	766.112500 MHz	Bosque Travis
341-344	25.00 KHz	796.137500 MHz	766.137500 MHz	Milam
345-348	25.00 KHz	796.162500 MHz	766.162500 MHz	Burnet Caldwell McLennan
349-352	25.00 KHz	796.187500 MHz	766.187500 MHz	Brazos
353-356	25.00 KHz	796.212500 MHz	766.212500 MHz	Coryell Hays
357-360	25.00 KHz	796.237500 MHz	766.237500 MHz	Llano Washington
365-368	25.00 KHz	796.287500 MHz	766.287500 MHz	Blanco Robertson
369-372	25.00 KHz	796.312500 MHz	766.312500 MHz	Grimes Hill Williamson
373-376	25.00 KHz	796.337500 MHz	766.337500 MHz	Burleson Hamilton
377-380	25.00 KHz	796.362500 MHz	766.362500 MHz	Bastrop Leon San Saba
381-384	25.00 KHz	796.387500 MHz	766.387500 MHz	Bell
385-388	25.00 KHz	796.412500 MHz	766.412500 MHz	Limestone Travis
389-392	25.00 KHz	796.437500 MHz	766.437500 MHz	Brazos
393-396	25.00 KHz	796.462500 MHz	766.462500 MHz	Coryell Lee
397-400	25.00 KHz	796.487500 MHz	766.487500 MHz	Falls
401-404	25.00 KHz	796.512500 MHz	766.512500 MHz	Bosque Hays
405-408	25.00 KHz	796.537500 MHz	766.537500 MHz	Lampasas Milam
409-412	25.00 KHz	796.562500 MHz	766.562500 MHz	Blanco Hill
413-416	25.00 KHz	796.587500 MHz	766.587500 MHz	Williamson

417-420	25.00 KHz	796.612500 MHz	766.612500 MHz	Grimes McLennan San Saba
425-428	25.00 KHz	796.662500 MHz	766.662500 MHz	Freestone Travis
429-432	25.00 KHz	796.687500 MHz	766.687500 MHz	Llano Madison
433-436	25.00 KHz	796.712500 MHz	766.712500 MHz	Washington
437-440	25.00 KHz	796.737500 MHz	766.737500 MHz	Burnet Caldwell Leon
441-444	25.00 KHz	796.762500 MHz	766.762500 MHz	Mills
445-448	25.00 KHz	796.787500 MHz	766.787500 MHz	Bastrop Bosque Robertson
449-452	25.00 KHz	796.812500 MHz	766.812500 MHz	Bell Blanco
453-456	25.00 KHz	796.837500 MHz	766.837500 MHz	Limestone
457-460	25.00 KHz	796.862500 MHz	766.862500 MHz	Coryell Hays
461-464	25.00 KHz	796.887500 MHz	766.887500 MHz	Lee
465-468	25.00 KHz	796.912500 MHz	766.912500 MHz	Brazos McLennan
469-472	25.00 KHz	796.937500 MHz	766.937500 MHz	Freestone Williamson
473-476	25.00 KHz	796.962500 MHz	766.962500 MHz	Hill Lampasas Washington
477-480	25.00 KHz	796.987500 MHz	766.987500 MHz	Falls Travis
481-484	25.00 KHz	803.012500 MHz	773.012500 MHz	Hamilton Williamson
485-488	25.00 KHz	803.037500 MHz	773.037500 MHz	Hays Leon Washington
489-492	25.00 KHz	803.062500 MHz	773.062500 MHz	Bell
493-496	25.00 KHz	803.087500 MHz	773.087500 MHz	Limestone
497-500	25.00 KHz	803.112500 MHz	773.112500 MHz	Milam
501-504	25.00 KHz	803.137500 MHz	773.137500 MHz	Bastrop McLennan
505-508	25.00 KHz	803.162500 MHz	773.162500 MHz	Brazos Lampasas
509-512	25.00 KHz	803.187500 MHz	773.187500 MHz	Falls Travis
513-516	25.00 KHz	803.212500 MHz	773.212500 MHz	Madison Mills
517-520	25.00 KHz	803.237500 MHz	773.237500 MHz	Burnet Caldwell
521-524	25.00 KHz	803.262500 MHz	773.262500 MHz	Lee
525-528	25.00 KHz	803.287500 MHz	773.287500 MHz	Hamilton Hays Robertson
529-532	25.00 KHz	803.312500 MHz	773.312500 MHz	Bell Grimes
533-536	25.00 KHz	803.337500 MHz	773.337500 MHz	Blanco Burleson

537-540	25.00 KHz	803.362500 MHz	773.362500 MHz	Coryell Fayette
541-544	25.00 KHz	803.387500 MHz	773.387500 MHz	Freestone Williamson
545-548	25.00 KHz	803.412500 MHz	773.412500 MHz	Lampasas Washington
549-552	25.00 KHz	803.437500 MHz	773.437500 MHz	Travis
553-556	25.00 KHz	803.462500 MHz	773.462500 MHz	Llano Milam
557-560	25.00 KHz	803.487500 MHz	773.487500 MHz	Bosque Leon
561-564	25.00 KHz	803.512500 MHz	773.512500 MHz	Bastrop Burnet
565-568	25.00 KHz	803.537500 MHz	773.537500 MHz	Brazos
569-572	25.00 KHz	803.562500 MHz	773.562500 MHz	Lee McLennan Mills
573-576	25.00 KHz	803.587500 MHz	773.587500 MHz	Hays Robertson
577-580	25.00 KHz	803.612500 MHz	773.612500 MHz	Coryell
581-584	25.00 KHz	803.637500 MHz	773.637500 MHz	Grimes Limestone Williamson
585-588	25.00 KHz	803.662500 MHz	773.662500 MHz	Burleson Caldwell San Saba
589-592	25.00 KHz	803.687500 MHz	773.687500 MHz	Bell
593-596	25.00 KHz	803.712500 MHz	773.712500 MHz	Travis Washington
597-600	25.00 KHz	803.737500 MHz	773.737500 MHz	Bosque Freestone Milam
601-604	25.00 KHz	803.762500 MHz	773.762500 MHz	Bastrop Llano
605-608	25.00 KHz	803.787500 MHz	773.787500 MHz	Brazos
609-612	25.00 KHz	803.812500 MHz	773.812500 MHz	Burnet Lee McLennan
613-616	25.00 KHz	803.837500 MHz	773.837500 MHz	Madison
617-620	25.00 KHz	803.862500 MHz	773.862500 MHz	Coryell Hays
621-624	25.00 KHz	803.887500 MHz	773.887500 MHz	Grimes Limestone Williamson
625-628	25.00 KHz	803.912500 MHz	773.912500 MHz	Burleson Caldwell San Saba
629-632	25.00 KHz	803.937500 MHz	773.937500 MHz	Bell
633-636	25.00 KHz	803.962500 MHz	773.962500 MHz	Leon Travis Washington
637-640	25.00 KHz	803.987500 MHz	773.987500 MHz	Bosque Milam
661-664	25.00 KHz	804.137500 MHz	774.137500 MHz	Mills Williamson
665-668	25.00 KHz	804.162500 MHz	774.162500 MHz	Hays

669-672	25.00 KHz	804.187500 MHz	774.187500 MHz	McLennan Brazos San Saba
673-676	25.00 KHz	804.212500 MHz	774.212500 MHz	Bell
677-680	25.00 KHz	804.237500 MHz	774.237500 MHz	Travis
701-704	25.00 KHz	804.387500 MHz	774.387500 MHz	Madison Williamson
705-708	25.00 KHz	804.412500 MHz	774.412500 MHz	Coryell Hays Washington
709-712	25.00 KHz	804.437500 MHz	774.437500 MHz	San Saba
713-716	25.00 KHz	804.462500 MHz	774.462500 MHz	Brazos Caldwell McLennan
717-720	25.00 KHz	804.487500 MHz	774.487500 MHz	Burnet Lee
741-744	25.00 KHz	804.637500 MHz	774.637500 MHz	Bastrop Llano
745-748	25.00 KHz	804.662500 MHz	774.662500 MHz	Bell
749-752	25.00 KHz	804.687500 MHz	774.687500 MHz	Grimes Travis
753-756	25.00 KHz	804.712500 MHz	774.712500 MHz	McLennan
757-760	25.00 KHz	804.737500 MHz	774.737500 MHz	Hays Lampasas Milam
781-784	25.00 KHz	804.887500 MHz	774.887500 MHz	Limestone Williamson
785-788	25.00 KHz	804.912500 MHz	774.912500 MHz	Brazos San Saba
789-792	25.00 KHz	804.937500 MHz	774.937500 MHz	Bell Fayette
793-796	25.00 KHz	804.962500 MHz	774.962500 MHz	Burleson Mills
797-800	25.00 KHz	804.987500 MHz	774.987500 MHz	McLennan Travis
821-824	25.00 KHz	805.137500 MHz	775.137500 MHz	Bastrop Coryell
825-828	25.00 KHz	805.162500 MHz	775.162500 MHz	Brazos Llano
829-832	25.00 KHz	805.187500 MHz	775.187500 MHz	Hill Williamson
833-836	25.00 KHz	805.212500 MHz	775.212500 MHz	Hays
837-840	25.00 KHz	805.237500 MHz	775.237500 MHz	Bell Fayette Madison
861-864	25.00 KHz	805.387500 MHz	775.387500 MHz	Freestone Lampasas Milam
865-868	25.00 KHz	805.412500 MHz	775.412500 MHz	McLennan Travis
869-872	25.00 KHz	805.437500 MHz	775.437500 MHz	Brazos
873-876	25.00 KHz	805.462500 MHz	775.462500 MHz	Coryell Hays
877-880	25.00 KHz	805.487500 MHz	775.487500 MHz	Madison Williamson
901-904	25.00 KHz	805.637500 MHz	775.637500 MHz	Bell

905-908	25.00 KHz	805.662500 MHz	775.662500 MHz	Travis
909-912	25.00 KHz	805.687500 MHz	775.687500 MHz	Brazos
				Lampasas
913-916	25.00 KHz	805.712500 MHz	775.712500 MHz	McLennan
917-920	25.00 KHz	805.737500 MHz	775.737500 MHz	Williamson
941-944	25.00 KHz	805.887500 MHz	775.887500 MHz	Bell
945-948	25.00 KHz	805.912500 MHz	775.912500 MHz	Limestone
				Travis

**REGION 49 700 MHZ CHANNEL ALLOTMENTS BY AREA, 08/29/03**

**Detailed Channel Allotments by Area**

<b>Area Name</b>	<b>Channel</b>	<b>Class</b>	<b>Base Freq</b>	<b>Mobile Freq</b>
Bastrop	81-84	General Use	764.512500	794.512500
	161-164	General Use	765.012500	795.012500
	201-204	General Use	765.262500	795.262500
	321-324	General Use	766.012500	796.012500
	377-380	General Use	766.362500	796.362500
	445-448	General Use	766.787500	796.787500
	501-504	General Use	773.137500	803.137500
	561-564	General Use	773.512500	803.512500
	601-604	General Use	773.762500	803.762500
	741-744	General Use	774.637500	804.637500
	821-824	General Use	775.137500	805.137500
Bell	17-20	General Use	764.112500	794.112500
	85-88	General Use	764.537500	794.537500
	133-136	General Use	764.837500	794.837500
	205-208	General Use	765.287500	795.287500
	249-252	General Use	765.562500	795.562500
	333-336	General Use	766.087500	796.087500
	381-384	General Use	766.387500	796.387500
	449-452	General Use	766.812500	796.812500
	489-492	General Use	773.062500	803.062500
	529-532	General Use	773.312500	803.312500
	589-592	General Use	773.687500	803.687500
	629-632	General Use	773.937500	803.937500
	673-676	General Use	774.212500	804.212500
	745-748	General Use	774.662500	804.662500
	789-792	General Use	774.937500	804.937500
837-840	General Use	775.237500	805.237500	
901-904	General Use	775.637500	805.637500	
	941-944	General Use	775.887500	805.887500
Blanco	201-204	General Use	765.262500	795.262500
	321-324	General Use	766.012500	796.012500
	365-368	General Use	766.287500	796.287500
	409-412	General Use	766.562500	796.562500
	449-452	General Use	766.812500	796.812500

	533-536	General Use	773.337500	803.337500
Bosque	137-140	General Use	764.862500	794.862500
	245-248	General Use	765.537500	795.537500
	337-340	General Use	766.112500	796.112500
	401-404	General Use	766.512500	796.512500
	445-448	General Use	766.787500	796.787500
	557-560	General Use	773.487500	803.487500
	597-600	General Use	773.737500	803.737500
	637-640	General Use	773.987500	803.987500
Brazos	13-16	General Use	764.087500	794.087500
	57-60	General Use	764.362500	794.362500
	129-132	General Use	764.812500	794.812500
	209-212	General Use	765.312500	795.312500
	253-256	General Use	765.587500	795.587500
	297-300	General Use	765.862500	795.862500
	349-352	General Use	766.187500	796.187500
	389-392	General Use	766.437500	796.437500
	465-468	General Use	766.912500	796.912500
	505-508	General Use	773.162500	803.162500
	565-568	General Use	773.537500	803.537500
	605-608	General Use	773.787500	803.787500
	669-672	General Use	774.187500	804.187500
	713-716	General Use	774.462500	804.462500
	785-788	General Use	774.912500	804.912500
	825-828	General Use	775.162500	805.162500
	869-872	General Use	775.437500	805.437500
	909-912	General Use	775.687500	805.687500
Burleson	173-176	General Use	765.087500	795.087500
	373-376	General Use	766.337500	796.337500
	533-536	General Use	773.337500	803.337500
	585-588	General Use	773.662500	803.662500
	625-628	General Use	773.912500	803.912500
	793-796	General Use	774.962500	804.962500
Burnet	161-164	General Use	765.012500	795.012500
	345-348	General Use	766.162500	796.162500
	437-440	General Use	766.737500	796.737500
	517-520	General Use	773.237500	803.237500
	561-564	General Use	773.512500	803.512500
	609-612	General Use	773.812500	803.812500
	717-720	General Use	774.487500	804.487500
Caldwell	249-252	General Use	765.562500	795.562500
	345-348	General Use	766.162500	796.162500
	437-440	General Use	766.737500	796.737500
	517-520	General Use	773.237500	803.237500
	585-588	General Use	773.662500	803.662500
	625-628	General Use	773.912500	803.912500
	713-716	General Use	774.462500	804.462500
Coryell	41-44	General Use	764.262500	794.262500
	97-100	General Use	764.612500	794.612500
	281-284	General Use	765.762500	795.762500

	353-356	General Use	766.212500	796.212500
	393-396	General Use	766.462500	796.462500
	457-460	General Use	766.862500	796.862500
	537-540	General Use	773.362500	803.362500
	577-580	General Use	773.612500	803.612500
	617-620	General Use	773.862500	803.862500
	705-708	General Use	774.412500	804.412500
	821-824	General Use	775.137500	805.137500
	873-876	General Use	775.462500	805.462500
Falls	93-96	General Use	764.587500	794.587500
	285-288	General Use	765.787500	795.787500
	325-328	General Use	766.037500	796.037500
	397-400	General Use	766.487500	796.487500
	477-480	General Use	766.987500	796.987500
	509-512	General Use	773.187500	803.187500
Fayette	49-52	General Use	764.312500	794.312500
	89-92	General Use	764.562500	794.562500
	133-136	General Use	764.837500	794.837500
	213-216	General Use	765.337500	795.337500
	293-296	General Use	765.837500	795.837500
	333-336	General Use	766.087500	796.087500
	537-540	General Use	773.362500	803.362500
	789-792	General Use	774.937500	804.937500
	837-840	General Use	775.237500	805.237500
Freestone	49-52	General Use	764.312500	794.312500
	89-92	General Use	764.562500	794.562500
	329-332	General Use	766.062500	796.062500
	425-428	General Use	766.662500	796.662500
	469-472	General Use	766.937500	796.937500
	541-544	General Use	773.387500	803.387500
	597-600	General Use	773.737500	803.737500
	861-864	General Use	775.387500	805.387500
Grimes	217-220	General Use	765.362500	795.362500
	369-372	General Use	766.312500	796.312500
	417-420	General Use	766.612500	796.612500
	529-532	General Use	773.312500	803.312500
	581-584	General Use	773.637500	803.637500
	621-624	General Use	773.887500	803.887500
	749-752	General Use	774.687500	804.687500
Hamilton	81-84	General Use	764.512500	794.512500
	129-132	General Use	764.812500	794.812500
	173-176	General Use	765.087500	795.087500
	253-256	General Use	765.587500	795.587500
	373-376	General Use	766.337500	796.337500
	481-484	General Use	773.012500	803.012500
	525-528	General Use	773.287500	803.287500
Hays	129-132	General Use	764.812500	794.812500
	209-212	General Use	765.312500	795.312500
	281-284	General Use	765.762500	795.762500
	353-356	General Use	766.212500	796.212500

	401-404	General Use	766.512500	796.512500
	457-460	General Use	766.862500	796.862500
	485-488	General Use	773.037500	803.037500
	525-528	General Use	773.287500	803.287500
	573-576	General Use	773.587500	803.587500
	617-620	General Use	773.862500	803.862500
	665-668	General Use	774.162500	804.162500
	705-708	General Use	774.412500	804.412500
	757-760	General Use	774.737500	804.737500
	833-836	General Use	775.212500	805.212500
	873-876	General Use	775.462500	805.462500
Hill	45-48	General Use	764.287500	794.287500
	165-168	General Use	765.037500	795.037500
	321-324	General Use	766.012500	796.012500
	369-372	General Use	766.312500	796.312500
	409-412	General Use	766.562500	796.562500
	473-476	General Use	766.962500	796.962500
	829-832	General Use	775.187500	805.187500
Lampasas	49-52	General Use	764.312500	794.312500
	213-216	General Use	765.337500	795.337500
	293-296	General Use	765.837500	795.837500
	405-408	General Use	766.537500	796.537500
	473-476	General Use	766.962500	796.962500
	505-508	General Use	773.162500	803.162500
	545-548	General Use	773.412500	803.412500
	757-760	General Use	774.737500	804.737500
	861-864	General Use	775.387500	805.387500
	909-912	General Use	775.687500	805.687500
Lee	393-396	General Use	766.462500	796.462500
	461-464	General Use	766.887500	796.887500
	521-524	General Use	773.262500	803.262500
	569-572	General Use	773.562500	803.562500
	609-612	General Use	773.812500	803.812500
	717-720	General Use	774.487500	804.487500
Leon	121-124	General Use	764.762500	794.762500
	281-284	General Use	765.762500	795.762500
	321-324	General Use	766.012500	796.012500
	377-380	General Use	766.362500	796.362500
	437-440	General Use	766.737500	796.737500
	485-488	General Use	773.037500	803.037500
	557-560	General Use	773.487500	803.487500
	633-636	General Use	773.962500	803.962500
Limestone	81-84	General Use	764.512500	794.512500
	201-204	General Use	765.262500	795.262500
	385-388	General Use	766.412500	796.412500
	453-456	General Use	766.837500	796.837500
	493-496	General Use	773.087500	803.087500
	581-584	General Use	773.637500	803.637500
	621-624	General Use	773.887500	803.887500
	781-784	General Use	774.887500	804.887500
	945-948	General Use	775.912500	805.912500

Llano	57-60	General Use	764.362500	794.362500
	173-176	General Use	765.087500	795.087500
	245-248	General Use	765.537500	795.537500
	285-288	General Use	765.787500	795.787500
	357-360	General Use	766.237500	796.237500
	429-432	General Use	766.687500	796.687500
	553-556	General Use	773.462500	803.462500
	601-604	General Use	773.762500	803.762500
	741-744	General Use	774.637500	804.637500
	825-828	General Use	775.162500	805.162500
Madison	429-432	General Use	766.687500	796.687500
	513-516	General Use	773.212500	803.212500
	613-616	General Use	773.837500	803.837500
	701-704	General Use	774.387500	804.387500
	837-840	General Use	775.237500	805.237500
	877-880	General Use	775.487500	805.487500
McLennan	53-56	General Use	764.337500	794.337500
	125-128	General Use	764.787500	794.787500
	177-180	General Use	765.112500	795.112500
	217-220	General Use	765.362500	795.362500
	257-260	General Use	765.612500	795.612500
	297-300	General Use	765.862500	795.862500
	345-348	General Use	766.162500	796.162500
	417-420	General Use	766.612500	796.612500
	465-468	General Use	766.912500	796.912500
	501-504	General Use	773.137500	803.137500
	569-572	General Use	773.562500	803.562500
	609-612	General Use	773.812500	803.812500
	665-668	General Use	774.162500	804.162500
	713-716	General Use	774.462500	804.462500
	753-756	General Use	774.712500	804.712500
797-800	General Use	774.987500	804.987500	
865-868	General Use	775.412500	805.412500	
	913-916	General Use	775.712500	805.712500
Milam	341-344	General Use	766.137500	796.137500
	405-408	General Use	766.537500	796.537500
	497-500	General Use	773.112500	803.112500
	553-556	General Use	773.462500	803.462500
	597-600	General Use	773.737500	803.737500
	637-640	General Use	773.987500	803.987500
	757-760	General Use	774.737500	804.737500
	861-864	General Use	775.387500	805.387500
Mills	329-332	General Use	766.062500	796.062500
	441-444	General Use	766.762500	796.762500
	513-516	General Use	773.212500	803.212500
	569-572	General Use	773.562500	803.562500
	661-664	General Use	774.137500	804.137500
	793-796	General Use	774.962500	804.962500
Robertson	41-44	General Use	764.262500	794.262500
	161-164	General Use	765.012500	795.012500

	245-248	General Use	765.537500	795.537500
	365-368	General Use	766.287500	796.287500
	445-448	General Use	766.787500	796.787500
	525-528	General Use	773.287500	803.287500
	573-576	General Use	773.587500	803.587500
San Saba	377-380	General Use	766.362500	796.362500
	417-420	General Use	766.612500	796.612500
	585-588	General Use	773.662500	803.662500
	625-628	General Use	773.912500	803.912500
	669-672	General Use	774.187500	804.187500
	709-712	General Use	774.437500	804.437500
	785-788	General Use	774.912500	804.912500
Travis	13-16	General Use	764.087500	794.087500
	53-56	General Use	764.337500	794.337500
	93-96	General Use	764.587500	794.587500
	137-140	General Use	764.862500	794.862500
	177-180	General Use	765.112500	795.112500
	217-220	General Use	765.362500	795.362500
	257-260	General Use	765.612500	795.612500
	297-300	General Use	765.862500	795.862500
	337-340	General Use	766.112500	796.112500
	385-388	General Use	766.412500	796.412500
	425-428	General Use	766.662500	796.662500
	477-480	General Use	766.987500	796.987500
	509-512	General Use	773.187500	803.187500
	549-552	General Use	773.437500	803.437500
	593-596	General Use	773.712500	803.712500
	633-636	General Use	773.962500	803.962500
	677-680	General Use	774.237500	804.237500
	749-752	General Use	774.687500	804.687500
	797-800	General Use	774.987500	804.987500
	865-868	General Use	775.412500	805.412500
	905-908	General Use	775.662500	805.662500
	945-948	General Use	775.912500	805.912500
Washington	97-100	General Use	764.612500	794.612500
	285-288	General Use	765.787500	795.787500
	357-360	General Use	766.237500	796.237500
	433-436	General Use	766.712500	796.712500
	473-476	General Use	766.962500	796.962500
	485-488	General Use	773.037500	803.037500
	545-548	General Use	773.412500	803.412500
	593-596	General Use	773.712500	803.712500
	633-636	General Use	773.962500	803.962500
	705-708	General Use	774.412500	804.412500
Williamson	45-48	General Use	764.287500	794.287500
	121-124	General Use	764.762500	794.762500
	169-172	General Use	765.062500	795.062500
	241-244	General Use	765.512500	795.512500
	289-292	General Use	765.812500	795.812500
	369-372	General Use	766.312500	796.312500
	413-416	General Use	766.587500	796.587500
	469-472	General Use	766.937500	796.937500

481-484	General Use	773.012500	803.012500
541-544	General Use	773.387500	803.387500
581-584	General Use	773.637500	803.637500
621-624	General Use	773.887500	803.887500
661-664	General Use	774.137500	804.137500
701-704	General Use	774.387500	804.387500
781-784	General Use	774.887500	804.887500
829-832	General Use	775.187500	805.187500
877-880	General Use	775.487500	805.487500
917-920	General Use	775.737500	805.737500

## Appendix H

**The following form is an electronic copy of the signed versions accompanying the original of this document.**

### **Sample Form Inter-Regional Coordination Procedures And Procedures for Resolution of Disputes That May Arise Under FCC Approved Plans**

#### **I. INTRODUCTION**

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the 700 MHz Regional Planning Committees of Regions 49, 40, 51 and 53.

#### **II. INTER-REGIONAL COORDINATION AGREEMENT**

1. The following is the specific procedure for inter-Regional coordination which has been agreed upon by Regions 49, 40, 51, and 53, and which will be used by the Regions to coordinate with adjacent Regional Planning Committees.

- a. An application-filing window is opened or the Region announces that it is prepared to begin accepting applications on a first-come/first-served basis.
- b. Applications by eligible entities are accepted.
- c. An application-filing window (if this procedure is being used) is closed

after appropriate time interval.

d. Intra-Regional review and coordination takes place, including a technical review resulting in assignment of channels.

e. After intra-Regional review, a copy of those frequency-specific applications requiring adjacent Region approval, including a definition statement of proposed service area, shall then be forwarded to the adjacent Region(s) for review. This information will be sent to the adjacent Regional chairperson(s) using the CAPRAD database.

f. The adjacent Region reviews the application. If the application is approved, a letter of concurrence shall be sent, via the CAPRAD database, to the initiating Regional chairperson within thirty (30) calendar days.

### **III. DISPUTE RESOLUTION**

1. If the adjacent Region(s) cannot approve the request, the adjacent Region shall document the reasons for partial or non-concurrence, and respond within 10 (Ten)-calendar days via email. If the applying Region cannot modify the application to satisfy the objections of the adjacent Region then, a working group comprised of representatives of the two Regions shall be convened within thirty (30) calendar days to attempt to resolve the dispute. The working group shall then report its findings within thirty (30) calendar days to the Regional chairpersons email (CAPRAD database). Findings may include, but not be limited to:

(a) Unconditional concurrence;

(b) Conditional concurrence contingent upon modification of Applicant's technical parameters; or

(c) Partial or total denial of proposed frequencies due to inability to meet co-channel/adjacent channel interference free protection to existing licensees within the adjacent Region.

2. If the Inter-Regional Working Group cannot resolve the dispute, then the matter shall be forwarded for evaluation to the National Plan Oversight Committee (NPOC), of the National Public Safety Telecommunications Council (NPSTC). Each Region involved in the dispute shall include a detailed explanation of its position, including engineering studies and any other technical information deemed relevant. The NPOC will, within thirty (30) calendar days, report its recommendation(s) to the Regional chairpersons via the CAPRAD database. The NPOC's decision may support either of the disputing Regions or it may develop a proposal that it deems mutually advantageous to each disputing Region.

3. Where adjacent Region concurrence has been secured, and the channel assignments would result in no change to the Region's currently Commission approved channel assignment matrix. The initiating Region may then advise the applicant(s) that their application may be forwarded to a frequency coordinator for processing and filing with the Commission.

4. Where adjacent Region concurrence has been secured, and the channel assignments would result in a change to the Region's currently Commission approved channel assignment matrix, then the initiating Region shall file with the Commission a *Petition to Amend* their current Regional plan's frequency matrix, reflecting the new channel assignments, with a copy of the *Petition* sent to the adjacent Regional chairperson(s).

5. Upon Commission issuance of an *Order* adopting the amended channel

assignment matrix, the initiating Regional chairperson will send a courtesy copy of the *Order* to the adjacent Regional chairperson(s) and may then advise the applicant(s) that they may forward their applications to the frequency coordinator for processing and filing with the Commission.

**III. CONCLUSION**

1. IN AGREEMENT HERETO, Regions 40, 50, 51, and 53 do hereunto set their signatures the day and year first above written.

Respectfully,

[all signatories to agreement]

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

2 If an applicant's proposed service area extends into an adjacent Public Safety Region (s), the affected Region(s) must approve the application. Service area shall normally be defined as the area included within the geographical boundary of the applicant, plus three (3) miles. Other definitions of service area shall be justified with an accompanying *Memorandum of Understanding (MOU)* or other application documentation between agencies, i.e. mutual aid agreements.

**Appendix I**

**DTV transition**

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