REGION 24 (MISSOURI) 700 MHz REGIONAL PLANNING COMMITTEE PLAN

Table of Contents

Appendices

1.0 769-775/799-805 MHz Regional Plan for Region 24 (Missouri)

This document is the Regional Plan for Region 24 (Missouri) describing how the 769-775/799-805 MHz General Use frequencies will be allocated and implemented in the Region.

1.1 Regional Chair

The Chairperson of Region 24 is:
Scott Bigham
1503 Benton Dr
Macon, MO 63552

(660) 415-0014
BighamS@apcointl.org

1.2 Other RPC Officers and full RPC Membership

The Vice Chairman/Secretary of Region 24 is:
Charles Gastler
Manager, Communications Service Center
St Louis Metropolitan Police Department
St Louis, MO 63103

(314) 444-5993
cdgastler@slmpd.org

The duties of Treasurer within Region 24 are assigned to Charles Gastler, Regional Vice Chairman.

Membership in the Region 24 Regional Planning Committee is open to any interested party. Committee Officer requirements, voting procedures and membership attendance requirements

are listed in the Region 24 Planning Committee bylaws. Appendix A contains the Region 24 bylaws. Appendix B is a list of Region 24's initial members, their agency/affiliation and voting status. Voting and operating procedures are described in Section 2.2 of this plan.

2.0 Region 24 Description

Region 24 encompasses the entire state of Missouri, consisting of 114 counties and the City of St Louis, which does not reside within a Missouri county. An alphabetical list of the individual counties can be found listed in Appendix C.

The State of Missouri has diverse geography along with a varied population base. Ground elevations in Missouri vary from 70 meters AMSL in the Mississippi Delta of extreme southeast Missouri to 500 meters AMSL in the Missouri Ozarks along the Arkansas border. The terrain of northern Missouri is relatively flat with sparsely populated areas, allowing for effective radio propagation. Throughout southern Missouri, however, varying ground elevations along with some of the worlds largest concentrations of lead, iron and other mineral deposits create a challenge to agencies in the Region attempting to develop efficient radio networks in any frequency band.

Missouri's roadways are some of the most frequently traveled in the country. The number of vehicles traveling Missouri roadways in 2002 amounted to well over seven (7) times its existing population of 5.8 million. These itinerant travelers take a heavy toll on all Missouri public safety agencies.

The population of Missouri is 5.8 million people (Census January 2001). Over 80 percent of this population is concentrated in the St Louis and Kansas City Metropolitan areas. These two large metropolitan areas are made up in part or all of 35 counties. These areas are adjacent to both Region 13 and Region 16 (Southern Illinois and the State of Kansas, respectively) and require Missouri to obtain inter-state frequency coordination with both Regions when attempting any frequency assignments in these densely populated areas.
Other areas in Missouri consist of small concentrated pockets of population surrounded by areas of sparse population or with large amounts of unpopulated U.S. federal forest. These diverse demographics, combined with the RF propagation difficulties stated above, make for challenging frequency allotments. Previously, frequency allotments in areas of Region 24 adjacent to Regional areas other than those listed above have been successful primarily due to the sparse population near each Regional border. Region 24 (State of Missouri) has eight (8) adjacent Regions. They are as follows:

Region 13 Southern Illinois
Region 17 State of Kentucky
Region 39 State of Tennessee
Region 4 State of Arkansas
Region 34 State of Oklahoma
Region 16 State of Kansas
Region 26 State of Nebraska
Region 15 State of Iowa

In previous NPSPAC 821 MHz frequency allotments, spectrum amounts disproportionate to population densities were allocated due to differing methodologies used in adjacent NPSPAC Regions and the timing of adjacent regions plan approval. This resulted in a minimum number of channels available for Region 24, particularly in the Kansas City and St. Louis areas. In the 700 MHz band, county allotments for both narrowband and wideband channels have been developed based on population densities relative to adjacent Regions. Due to the Region's diverse population densities and the scarce spectrum resources in Missouri's populated areas, it is anticipated the majority of requests for voice/data spectrum will be from the Kansas City and St Louis metropolitan areas, which both currently operate existing 800 MHz radio networks. It is anticipated that other areas within Region 24, including areas in the Southwestern parts of Missouri, may request 700 MHz channels from established county pool allotments to either expand existing 800 MHz systems or develop new 700 MHz systems

2.1 Notification Process

821 MHz Region 24 Chairperson, Stephen T. Devine, appointed Ron Shook of Greene County 700 MHz Convenor on July 1, 2000. A 700 MHz Regional Planning Committee meeting date was set for October 5, 2000. Interested parties were given 90 days notice prior to the first meeting. Announcements indicating the date, time and location of the first meeting were sent by mail to the FCC Wireless Telecommunications Bureau and, posted in the following industry periodicals: MRT Magazine, Radio Resource Magazine and the Association of Public Safety Communications Officials, Inc. magazine. The meeting information was also posted on the Missouri Uniform Law Enforcement System (MULES) Teletype network and received by all law enforcement agencies in both Missouri and the surrounding Regions. The Missouri State Highway Patrol also issued a press release regarding the convening of the committee and including the first meeting information. This awareness allowed for the dissemination of meeting information to hundreds of law enforcement agencies, public safety agencies and news media throughout Missouri and the eight (8) adjacent states to Missouri. The Missouri State Emergency Management Agency, along with the Missouri National Guard was contacted and notified of the convening of the 700 MHz Regional Planning Committee. The convener also contacted several agencies via email that expressed interest in the planning process prior to the meeting. There are no Native American tribal reservations located within Region 24. Copies of the announcements sent to the FCC, any Public Notices released relating to Region 24's meeting, the ads placed in the industry periodicals, the Missouri SHP press release, and emails sent to interested agencies are included in Appendix D. The 700 MHz first meeting convened on October 5, 2000 by Ron Shook. Stephen T. Devine was elected the Chairperson of the Region 24 700 MHz Regional Planning Committee. Mr. Steve Makky, Sr. of the St Charles County Emergency Management Agency was elected to the position of Vice Chairperson/Secretary of the Region 24 700 MHz Regional Planning Committee. The FCC did not issue a Public notice for this meeting.

2.2 Operations of the Regional Plan Committee

This committee will use Robert's Rules of Order to conduct meetings. All decisions will be by clear consensus vote with each Public Safety Agency in attendance having one (1) vote. Additional voting member considerations are listed in the Region 24 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.

Subcommittees have been formed as needed to work on specific issues. For the initial planning of Region 24, three subcommittees were formed:

Implementation, Interoperability, and Technology Subcommittees:
These subcommittees are intended to work on the details of specific issues and make recommendations to the full committee for the development of the Region 24 Regional plan. Any changes to the Regional plan must be voted and approved by the full Regional Planning Committee. Participation in subcommittees is open to any member. The Chair of the Regional Planning Committee appoints each Subcommittee Chair. The Region 24 subcommittees are listed below. Subcommittee participation is open to the entire membership, with the Chairpersons responsible for ensuring the content and atmosphere of the plan best represents the region as a whole.

Technology:
Steve Makky, Sr. St Charles County Emergency Management, **Chairperson**
Charles Gastler, St Louis City Police Department, Member
Thomas Kearns, Tyco/MA-Com, Commercial Member
Roger Strope, Missouri State Highway Patrol, Member
Jon Martin, Motorola Commercial Member

Interoperability:
William Cade, Jasper County 911, **Former Chairperson** (Moved from Region 24 in Spring 2002 to the State of Florida and Ron Shook, Greene County Emergency Management was appointed Interoperability Subcommittee Chairperson by the Regional Chair). Ron Shook, Greene County Emergency Management, **(Chairperson)** Stephen T. Devine, Missouri State Highway Patrol

Implementation:
Stephen T. Devine, **Chairperson**
Roger D. Strope, Missouri State Highway Patrol

A minimum of two (2) full committee meetings will be held every twelve months. When possible, meetings will be held in the months of April and October. The Region 24 Chairperson has the authority to call an additional meeting at a time when he/she deems necessary or when he/she deems it 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 Regional 700 MHz Planning Committee, one (1) of the two meetings will be held in various locations within Region 24 and due to its central location, the remaining meeting will be held in Jefferson City, Missouri.

The Region 24 700 MHz list-serve, http://groups.yahoo.com/group/RPC24/ was created in July of 2001. The Region 24/Missouri public safety communications list serves,
http://groups.yahoo.com/group/NPSPACRegion24/,
http://groups.yahoo.com/group/rpc24
http://groups.yahoo.com/group/region24siec

http://groups.yahoo.com/group/moapco911
http://lists.mo.gov/mailman/listinfo/region24rpc

All were created in 2000 to exchange information as well as disseminate original meeting times, dates and agendas throughout the Regional Planning process for the initial 700 MHz meeting and subsequent Region 24 (Missouri) SIEC meetings. These list serves are utilized to disseminate messages on regional planning progress and meeting agendas and serves as an excellent historical resource for regional planning development.

Beginning two years after Federal Communications Commission approval of this Regional Plan, the Chairperson shall call a meeting of the Regional Planning Committee to elect a Chair, Vice Chair and Secretary to serve for a two-year term. There is no limit to the number of terms that may be served by officers of the 700 MHz Regional Planning Committee.

If the Chair is unable to serve a complete term, the Vice Chair will serve as Chair until the next 700 MHz Regional meeting. If both the Chair and Vice Chair are unable to serve their full terms, one or the other should make an effort to call a special meeting of the Committee to elect replacements. If for some reason, neither the Chair nor the Vice Chair can call the special meeting; the State or any County within the Region may call for a special meeting, giving at least 5 days notice, to elect replacements.

A chronological list of meetings, summary of minutes, meeting announcements and agendas outlining Region 24 progress in 700 MHz development is located in **Appendix D** of this document.

3.0 Regional Plan Administration

3.1 Procedure for Requesting Spectrum Allotments

A. Upon FCC approval of this Plan, Region 24 will announce to the region that 700 MHz public safety channels are available in the Region and that channels have been assigned to pool allotments to counties within the Region. All available methods will be used to notify public safety entities of channel availability in the Region (see Section 2.1). All requests will be considered on a first come, first served basis. Region 24 supports the National Coordination Committee Pre-Assignment Rules and Recommendations listed in Appendix F, and will use these guidelines as a template to determine if an application submitted to the Regional Planning Committee meets Regional Planning standards. It is recommended that applicants familiarize themselves with these recommendations prior to submitting applications for Region 24 700 MHz public safety system implementation. In order to maintain accurate records in the CAPRAD database, applicants will provide Region 24 with physical copies of their application along with associated documentation for Regional Planning Committee review. The Regional Planning Committee will enter the FCC 601 form into the CAPRAD database before the application is forwarded to the FCC certified coordinators.
In general and unless otherwise noted, the Region 24 Regional Planning Committee will

adhere to the published National Coordination Committee Implementation Guidelines for 700 MHz Public Safety Regional Planning Committees.

B. When applying for new 700 MHz channels, the Regional Planning Committee looks forward to 700 MHz applicants working with neighboring agencies to promote and continue the establishment of interoperability within their community and allow for the equitable distribution of existing spectrum allocations to promote efficient frequency use when applying for 700 MHz spectrum. Region 24 expects applicants to be cognizant of the fact that moving to the 700 MHz band may create a degree of isolation between themselves and neighboring agencies, and Region 24 looks forward to working with these applicants on a case-by-case basis on how to maintain spectrum availability in their area, while continuing to promote interoperable communications.

C. To request channels from Region 24, a full application package must be submitted to the Regional Planning Committee in physical written form for entry by Region 24 personnel in the CAPRAD database http://caprad.nlectc.du.edu/login/home. The application must include:

An FCC Form 601,
A short description of the proposed system,
A justification for the additional spectrum,
An interference prediction map using the current version of TIA/EIA TSB 88 guidelines,
Maps showing all interference predicted in the proposed system,
Documents indicating agency-funding commitments sufficient to fund the development of the proposed system(s) and an indication as to when they will migrate from their existing system to the new system.

D. The Chair will distribute the request to all other agencies with allotments in the plan for review and approval electronically. Absent a protest, the Regional Planning Committee will approve the application and (if applicable), upon receipt of a 'cancellation consent letter' (See Section 3.1 B. above), submit it, through the CAPRAD database, to the applicant's preferred FCC-certified frequency coordinator for processing. This process meets the requirements of Rule 90.176 (c). The CAPRAD database will reflect the approved application and place the channels for the proposed system in "pre-license" status.

E. Allocation Disputes: An agency may protest a proposed system within 30 calendar days of the original distribution. Protests will only be considered if the allocation does not conform to plan criteria or objecting agency or the Chairperson can show harmful interference is likely based on the information submitted by the agency requesting the new allocation. If an agency with pre-licensed/Region approved co-channel or adjacent channel allocations objects to a proposed allocation due to concerns about potential interference, the objecting agency may request field tests be done to confirm or refute interference potential. The completion of these field tests will be required for Regional application approval. Coverage area service/interference contours of the proposed system(s) should meet values designated in Section 6.1 of this document. Any costs associated with field tests or any other requirement to obtain Region 24 plan approval are the responsibility of the agency submitting application to Region 24.
The parties involved must resolve the allocation dispute and notify the Region Chair within

14 calendar days. If the parties involved cannot resolve the allocation dispute within that timeframe, then a special full Committee meeting will be scheduled to consider and vote on the protest. If approved, the application will be submitted through the CAPRAD database to the applicant's chosen FCC-certified frequency coordinator for processing

F. Lower Power "Campus Eligible" General Use Channels:
In the implementation of 700 MHz public safety spectrum throughout Region 24, there may be opportunities for increased channel reuse when developing radio systems for "campus" type operations. Examples of those who may capitalize on this opportunity include hospitals, stadiums, malls or places of public gathering, public universities, transit systems and ports. While these channels have been designated in county pool allotments with proper designations, they do not enjoy the benefits of countywide channels in that they are not cleared for usage over a wide area. In many instances, facilities require a smaller or more specific geographical coverage area than assumed in the initial channel packing plan and may be able to be reused more efficiently. These "campus" type systems also, in many cases, require in-building or confined space/ tunnel radio coverage or communications along a linear pathway, such as a maintenance or right of way. Public safety channels can be allotted to this type operation in a region and can lead to effective system development, along with increased spectral efficiency, if power levels and Area of Protection (AOP) of the area are taken into account in system planning. These parameters must be established appropriate to the area of coverage. In order to facilitate this effective method of system implementation, channels have been identified in certain areas of Region 24 that may be utilized in a smaller service area. These channels are NOT eligible to be utilized throughout the county they are allotted to and the following criteria must be adhered to when requesting channels from Region 24 for operations of this type:

The 50dBu service contour of the proposed system must not exceed an area more than 2 miles from the proposed service area. When this 2-mile distance extends to an adjacent region, the applicant must obtain concurrence from the adjacent region. Reduced external antenna height, along with reduced ERP, directional antennae, distributed antenna systems, radiating "leaky coax," are all tools that should be utilized in the development of these type systems.

Region 24 will ensure the development of these type of systems will in no way interfere with co-channel or adjacent channel users within Region 24 or Region 24's adjacent regions. The Chairperson, or a majority of the members of the region, has the authority to request and require engineering studies from the applicant that indicate no harmful interference will be introduced to any co-channel or adjacent channel existing user prior to application approval.

For 12.5/25 kHz co-channel assignments, the 50dBu service contour of the proposed stations will be allowed to extend beyond the defined service area for a distance no greater than 2 miles. An adjacent/alternate 12.5/25 kHz channel shall be allowed to have its 60 dB μ (50,50) contour touch, but not overlap the 40dB μ service (50,50) contour of an adjacent/alternate system being protected. Evaluations should be made in both directions to ensure compliance. The approval of systems utilizing county allotment channels labeled "Campus", are subject to approval of the Region 24 700 MHz regional

planning committee. They are the final authority on parameters associated with "campus" type operations.

If Region 24 receives an application for low power fixed use and the proposed service contour encroaches onto an adjacent region prior to the channel allotted to the region being implemented in a specific system, the application must be modified so the service contour does not encroach into the adjacent region **or** the applicant must supply the Region 24 700 MHz Regional Planning Committee with written concurrence from the adjacent region permitting the original design.

3.2 Procedure for Frequency Coordination

The Region 24 Planning Committee will adhere to 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 Region created its own sort for the wideband data channels. (See Appendix G). Region 24 will participate in the CAPRAD database and keep the Regional Plan and current frequency allotment/allocation information on the database. The Region 24 Regional Planning Committee has both the ability to accept recommendations from the committee and, if approved, the authority to change the original frequency allotment. In order to keep the most current frequency allotments within Region 24, an annual review of the allotments will be made at one of the scheduled meetings by the full committee and recommended changes to the plan will be voted on. The majority of members in attendance at a meeting of the full Regional Planning Committee must approve any changes to the Regional allotments. If at any time a system is allocated channels within Region 24 and the system cannot be developed within the agreed upon guidelines (slow growth), the channels will be returned to the county pool allotments they originated from and again be available to other agencies in the region. If plan modifications are approved, the Chairperson will, if necessary, obtain adjacent Region approval and file a plan amendment indicating the approved changes with the Federal Communications Commission.

3.3 Allocation of Narrowband "General Use" Spectrum

The Region 24 Technology Subcommittee recommends that allotments 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. This recommendation is approved by the full Committee and is part of this plan. Allotments will be made in 25 KHz groups to allow for various digital technologies, at various bandwidths, to be implemented. All agencies requesting spectrum during the initial filing window (see Section 3.1) will be allocated channels if plan requirements 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 the geographic separation of each 12.5 KHz adjacent channel. In order to promote spectrum efficiency, Region 24 will ensure that systems allocated 25 KHz channel blocks will utilize all of the channel and not "orphan" any portions of a system designated channel. (See Section 6.3).

The Region 24 700 MHz Regional Planning Committee will be the final authority on the

approval of applications for 700 MHz General Use channel allocations.

3.4 Low Power Channels

The FCC in the 700 MHz band plan set aside channels 1 - 8 paired with 961 – 968 and 949 – 958 paired with 1909 – 1918 for low power use for on-scene incident response purposes using mobiles and portables subject to Commission-approved Regional Planning Committee Regional Plans. Transmitter power must not exceed 2 watts (ERP).

Channels 9 –12 paired with 969 – 972 and 959 – 960 paired with 1919 – 1920 are licensed nationwide for itinerant operation. Transmitter power must not exceed 2 watts (ERP). These channels may operate using analog operation. To facilitate analog modulation, this plan will allow aggregation of two 6.25 KHz channels for 12.5 kHz bandwidth. On scene temporary base and mobile relay stations are allowed (to the extent FCC rules allow) antenna height limit of 6.1 meter (20 feet) AGL (Above Ground Level). However, users are encouraged to operate in simplex mode with the least practicable amount of power to reliably maintain communications whenever possible. 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. The use of EIA/ TIA-102, Project 25 Common Air Interface is required when using a digital mode of operation.

In its dialog leading up to CFR §90.531 allocating the twenty-four low power 6.25 kHz frequency pairs (of which eighteen fall under RPC jurisdiction)[1], the Federal Communications Commission (FCC) suggested that there is a potential for multiple low power applications, and absent a compelling showing, a sharing approach be employed rather than making exclusive assignments for each specific application as low power operations can co-exist [in relatively close proximity] on the same frequencies with minimal potential for interference due to the 2 watt power restriction.

[1] See paragraphs 35 through 39 in FCC's Third Memorandum Opinion and Order for WT Docket No. 96-86 adopted September 18, 2000.

Whereas advantages exist in not making assignments, the reverse is also true. If, for example, firefighters operate on a specific frequency or set of frequencies in one area, there is some logic in replicating that template throughout the Region for firefighter equipment. If there are no assignments, such a replication is unlikely.

In seeking the middle ground with positive attributes showing up both for assignments and no assignments, we recommend the following regarding assignments associated with the eighteen (18) low power channels for which the Regional Planning Committee has responsibility:

- Generic - Channel #'s 1-4 and 949-952 are set aside as generic 2 watt channels for use by public safety agencies operating within Region 24, and the complementary mobile channels # 961-964 and 1909-1912 are set aside as 2 watt generic mobile channels also for use by public safety agencies likewise operating within Region 24.
- Fire/ EMS/ Consequence Management - Channel #'s 5-8 are designated as Fire Protection/Emergency Medical and Consequence Management 2 watt channels for licensing and exclusive use by the Fire/Emergency Medical disciplines, and the

complementary mobile channel #'s 965-968 are set aside as Fire/Emergency Medical and Consequence Management 2 watt mobile channels also for licensing and exclusive use by the Fire/Emergency Medical disciplines.

· Law/ Crisis Management - Channel #'s 953-956 are set aside as Law nforcement/Crisis Management 2 watt channels for licensing and exclusive use by the Law Enforcement discipline, and the complementary 2 watt mobile channel #'s 1913-1916 are set aside as Law Enforcement/Crisis Management mobile channels also for licensing and exclusive use by the Law Enforcement discipline.

Multidisciplinary Joint Public Safety Operations - Channel #'s 957-958 are set aside as Multidisciplinary Joint Public Safety Operations 2 watt channels for licensing and the complementary 2 watt mobile channel #'s 1917-1918 are also set aside as Multidisciplinary Joint Public Safety Operations 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 repeaterized 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. Again, Region 24 Regional Planning Committee will recommend to the Missouri SIEC that all 700 MHz users and applicants to have **the capability to access** ALL of the thirty-two (32) NCC approved interoperability channels in both duplex and simplex modes. Under no circumstances may a user claim a channel as exclusively theirs; all 700 MHz interoperability channels are under the administration of the Missouri Statewide Interoperability Executive Committee.

3.5 Wideband Data

This section was deleted due to the FCC Second Report and Order, 07-132 released August 10, 2007.

However, if any entity desires to implement either a wideband (50 kHz – 150 kHz) or broadband data system, they may contact the Public Safety Broadband Trust as set forth in FCC 07-132 Second Report and Order and subsequent information released by the FCC and PSBT.

Four General Use 6.25 kHz channels may still be combined to form one 25 kHz data channel.

3.6 Dispute Resolution – Intra-Regional

In the event an agency disputes the implementation of this plan or the Federal Communications Commission approval of this plan or parts of this plan, the agency must notify the Chair of the dispute in writing. This section does not apply to protests over new spectrum allocations (see Section 3.1). The Chair will attempt to resolve the dispute on an informal basis. If a party to the dispute employs the Chair, then the Vice Chair will attempt resolution. In such cases, the Chair shall be deemed to have a conflict of interest and will be precluded from voting on such matters. If after 30 days the dispute is not resolved, the Chair

(or Vice Chair) will appoint a Dispute Resolution Committee consisting of a member from the State of Missouri and at least five members from the Counties in Region 24. That committee will select a Chair to head the committee.

The Regional Plan Chair (or Vice Chair) will represent the Region in presentations to the Dispute Resolution Committee. The Committee will hear input from the disputing agency, any effected agencies and the Region Chair. The Committee will then meet in executive session to prepare a recommendation to resolve the dispute. Should this recommendation not be acceptable to the disputing agency/agencies, the dispute and all written documentation from the dispute will be forwarded to the National Association of Regional Planning Committee for dispute resolution. As a last resort, the dispute will be forwarded to the Federal Communications Commission for final resolution.

3.7 Priority Matrix

In the event that spectrum allocation requests conflict and cannot all be accommodated, the following matrix will be used to determine priority for allotment. This matrix will only be used if two requests are received in the same time frame for the same number of channels. Otherwise, the first come first served procedure of Section 3.1 will be used.

- 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 multiple jurisdictional, multiagency, inter-discipline interoperable communications within a sub-regional area. These systems can be either a group of separate departments within a large agency or groups of agencies operating together under a large blanket agency, or a combination of both. (25 points)
- Documentation of proposed funding to construct the system using these 700 MHz frequencies must be available and accompany the original spectrum request. (25 points)
- The submission of some form of 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 will be required to be submitted to the Regional Planning Committee prior to approval. (35 points)

If there are more applicants than frequencies available for a given area, the above criteria will be used to grade each application before the committee.

This process, if required, will be treated as a dispute and the procedures outlined in Section 3.6 using the above criteria will be used to allocate the frequencies.

3.8 Reserve Channel Reclassification

This section is added due to FCC Report and Order 14-172, October 24, 2014 requiring 700 MHz Regional Planning Committees to modify their plan to outline the region's use of reallocated former Reserve Channels to General Use Channels.

700 MHz PLAN MODIFICATION REQUIRED FOR ALL REGIONS

October 24, 2014 FCC Report and Order 14-172
Reserve Channel Reclassification-

The language below is from the FCC's Report and Order indicated above that outlines the changes 700 MHZ RPC's need to make to their existing plans with the former Reserve channels being reallocated to General Use.

Discussion (FCC 14-172)
Paragraph 39. We conclude that the 700 MHz Reserve Channels should be added to the General Use pool and made available for multiple uses under RPC administration. The demand for 700 MHz narrowband spectrum has significantly increased in recent years, particularly in large urban areas. Some 700 MHz licensees have channel requirements that have surpassed what was envisioned in the original channel allotment process. Moreover, in Los Angeles, Washington DC, and other major metropolitan areas, the Reserve Channels offer much-needed capacity for relocating T-Band public safety licensees as required by the Public Safety Spectrum Act.

Paragraph 40. To accommodate these spectrum demands, we adopt the following overall approach. Rather than dedicating the Reserve Channels exclusively for use with deployable systems, **we require the RPCs to administer the Reserve Channels subject to the following.**

In the non T-Band areas, up to eight 12.5 kilohertz channels may be dedicated for temporary deployable trunked use and the rest for General Use, including low-power vehicular repeaters. In the T-Band markets, all twenty-four Reserve Channels will be available for General Use with priority given to relocating T-Band incumbents that commit to return an equal amount of T-Band channels.

The RPCs shall submit channel plans consistent with this Report and Order within six months from publication in the Federal Register.112 We encourage T-Band licensees transitioning to the former Reserve Channels to consider using spectrally efficient 6.25 kHz technology given the limited number (24) of available former Reserve Channels.

Regional Planning Committees, per the FCC language above, have a number of options to consider when repurposing the former Reserve Channels within their regions. Those regions that include T-Band areas must prioritize the assignment of all 24 Reserve Channels to those T-Band licensees. The FCC has recommended that up to eight (8) Former Reserve Channels be designated for nationwide deployable use and the National Public Safety Telecommunications Council (NPSTC) and the National Regional Planning Council (NRPC) have submitted to the FCC their recommendations for six (6) Former Reserve Channels that should be considered for nationwide deployable use, in bold in the Reserve Channel List below:

FCC Channel	CAPRAD Channel Label	Base Frequency	Mobile Frequency	Status
37-38	**General Use-D**	**769.231250**	**799.231250**	**Recommended for Nationwide Deployable Use**

61-62	**General Use-D**	**769.381250**	**799.381250**	**Recommended for Nationwide Deployable Use**
77-78	General Use	769.481250	799.481250	Recommended for Vehicular Repeater Use (MO3)
117-118	**General Use-D**	**769.731250**	**799.731250**	**Recommended for Nationwide Deployable Use**
141-142	**General Use-D**	**769.881250**	**799.881250**	**Recommended for Nationwide Deployable Use**
157-158	General Use	769.981250	799.981250	Recommended for Vehicular Repeater Use (MO3)
197-198	General Use	770.231250	800.231250	Available
221-222	General Use	770.381250	800.381250	Available
237-238	General Use	770.481250	800.481250	Available
277-278	General Use	770.731250	800.731250	Available
301-302	General Use	770.881250	800.881250	Available
317-318	General Use	770.981250	800.981250	Available
643-644	General Use	773.018750	803.018750	Available
683-684	General Use	773.268750	803.268750	Available
699-700	General Use	773.368750	803.368750	Available
723-724	General Use	773.518750	803.518750	Available
763-764	General Use	773.768750	803.768750	Available
779-780	General Use	773.868750	803.868750	Available
803-804	General Use	774.018750	804.018750	Available
843-844	General Use	774.268750	804.268750	Available
859-860	General Use	774.368750	804.368750	Recommended for Vehicular Repeater Use (MO3)
883-884	**General Use-D**	**774.518750**	**804.518750**	**Recommended for Nationwide Deployable Use (Alt CC)****
923-924	General Use	774.768750	804.768750	Recommended for Vehicular Repeater Use (MO3)
939-940	**General Use-D**	**774.868750**	**804.868750**	**Recommended for Nationwide Deployable Use (Pri CC)****

** Channels 883-884 and 939-940 are designated as Alternate and Primary Control Channels for the Nationwide 700 MHz Deployable Trunked Systems.

The Region 24 700 MHz Regional Planning Committee submits this 700 MHz plan modification to the Commission in accordance with the Report and Order (14-172) and the requirements assigned to each regional planning committee therein.

Region 24 will modify its existing 700 MHz plan utilizing the following channel plan for the former Reserve Channels:

We add channels
37-38, 61-62, 117-118, 141-142, 883-884, and 939-940
To be utilized as Nationwide Deployable Trunked Channels consistent with the NPSTC/NRPC recommendation to the FCC utilizing the recommended system and unit identifiers from NPSTC/NRPC.

We add channels
77-78 and 157-158
to be utilized as 2 watt vehicular repeater frequencies (MO3), to be coordinated for and specifically for use with 800 MHz systems in the region due to the needed separation between these frequencies and those utilized by public safety in the 800 MHz band.

We add channels
859-860 and 923-924
As 2 watt non-800 MHz vehicular repeater frequencies (MO3) to be coordinated for use with other systems in the region.

We modify the Region 24 700 MHz plan to utilize the remaining channels as "floating allotments" to supplement the existing General Use allotments in each region: 197-198, 221-222, 237-238, 277-278, 301-302, 317-318, 643-644, 683-684, 699-700, 723-724, 763-764, 779-780, 803-804, 843-844. Allowing these remaining channels to supplement the existing General Use allotments utilized within the region will promote maximum flexibility of the use of these channels in each region.

Lastly, Region 24 700 MHz Regional Planning Committee encourages the Commission to permit the introduction of new 700 MHz General Use channels in a flexible manner where the channels are available to all existing allotments where the channel use can be most optimum. 700 MHz Regional plan modifications need to reiterate the Intra-Region and Inter-Region coordination protocol in use currently in the region and how these new flexible allotments will be subject to the same coordination protocol within the region. Finally, Region 24 will utilize the same intra-region and inter-region coordination practices with these new, flexible General Use allotments as required in their current plan.

4.0 PROCESS FOR HANDLING UNFORMED REGIONS

The Implementation Subcommittee recommends that all Regions use the following pre-planning methodology to facilitate coordination with adjacent Regions. This procedure will provide a spectrum allotment for adjacent Regions that do not immediately form a Committee.

Counties or other geographic subdivisions within 70 miles of the Regional border need to share spectrum with the adjacent Region(s). The sharing indicated is inherent in the NPSTC Packing Program, as it views all counties nationwide as separate entities while ignoring state borders. With all criteria being equal, this ensures all counties are provided sufficient spectrum in accordance with their surrounding counties. The appropriate ratio of channels shall be allotted to counties in adjacent Regions based upon each county's population. A 25 kHz building block will

be used to distribute spectrum between the Regions. A description of the demographics of the affected border areas shall be included.

The requirements for adjacent Region concurrence will require a waiver if the adjacent Region has not yet formed. The Region filing the Plan must use the pre-planning procedure outlined above.

The waiver request must be filed concurrently with the Plan and contained in the cover letter.

5.0 Coordination with Adjacent Regions

The Regions adjacent to Region 24 are listed below:

Region 13, Southern Illinois
Region 17, Kentucky
Region 39, Tennessee
Region 4, Arkansas
Region 34, Oklahoma
Region 16, Kansas
Region 26, Nebraska
Region 15, Iowa

Region 24 has coordinated channel allocations and received concurrence with all its bordering Regions by providing copies of the Region 24 plan (including channel allotments) to each adjacent Region using the CAPRAD database and by mailing hard copies of the Plan to the adjacent Region's Chairperson or Convener.

Region 24's borders with Region 4 and Region 34 are sparsely populated and generally, the existing NPSPAC 821/866 MHz band frequencies are not built out on either side of these regional border areas with Region 24. The east central and west central Region 24 borders, with Region 13 and Region 16 respectively, are some of the most urban densely populated areas of Missouri, while Region 24's borders with Region 34 (Oklahoma), Region 26 (Nebraska), Region 39 (Tennessee), Region 4 (Arkansas), Region 15 (Iowa) and Region 17 (Kentucky) are some of the most rural, sparsely populated areas in the Midwest. The CAPRAD database and its associated packing plan will provide minimum channel allotments for all of Region 24'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 assigned in their borders.

Therefore, adjacent Regions 4, 34, 16, 15, 26, 13, 17,and 39 should all be able to satisfy voice and narrowband data requests along their border areas with Region 24. However, if an adjacent Region has difficulties satisfying intra-regional requests due to channel allocation within Missouri, 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.

6.0 System Design/Efficiency Requirements

6.1 Interference Protection

The frequency allotment list in Missouri's counties result from the fact that the original frequency sort did not anticipate high site system development that placed a priority on few sites all operating at high ground elevations providing weak signal strength at the edge of a jurisdictions coverage area. Rather, the sort utilized contours to maximize frequency re-use across the country. This is based on an 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 coverage area and minimum levels in the coverage area of other co-channel users. Quality system engineering, the use of directional antennae and the advocacy of multi-agency/multi-discipline systems that promote interoperability can accomplish this goal. A jurisdictions coverage area is normally the geographical boundaries of the Agency(s) served plus a three to five mile area beyond. Systems should be designed for minimum signal strength of 40 dB μ in the system coverage area while minimizing signal power out of the coverage area. TIA/EIA TSB88-A (or latest version) will be used to determine harmful interference assuming 40 dB μ , or greater, signal in all systems coverage areas. This may require patterned antennas and extra sites compared to a design that assumes noise limited coverage. Region 24 complies with National Coordination Committee recommendations listed in Appendix K of the Regional Planning Committee Guidelines published by the National Coordination Committee (NCC).

6.2 Spectrum Efficiency Standards

Initial allotments will be made on the basis of 25 kHz channels. To maximize spectrum utilization, prudent engineering practices and receivers of the highest quality must be used in all systems. Given a choice of radios to choose from in a given technology family, agencies should use the units with the best specifications. This plan will not protect agencies from interference if their systems are under-constructed (ie; areas with the established service area having minimum signal strength below 40 dBu), or the systems utilize low quality receivers. The applicants implementation of prudent engineering practices will be encouraged by the Regional Planning Committee at all times.

It is the eventual goal of the FCC and the public safety community for radio equipment to meet the requirement of one voice channel per 6.25 KHz of spectrum. When applying for channels within Region 24, the applicants should acknowledge the deadline for converting all equipment to 6.25 kHz or 6.25 kHz equivalent technology is 12/31/2016. For narrowband mobile data requests, one mobile data channel will consist of two (2) 6.25 KHz channels/one (1) 12.5 KHz channel. Narrowband 6.25 KHz channels can be aggregated for data use to a maximum bandwidth of 25 KHz. As 6.25 KHz migration evolves, an agency that creates any "orphaned" 6.25 KHz channels should realize that these channels would be allocated to nearby agencies requesting channels to maintain consistent grouping and utilization of 25 KHz blocks within the region. (See Section 6.3)

Region 24 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 throughput for all agencies involved than that which could be achieved individually.

6.3 Orphaned Channels

The narrowband pool allotments with Region 24 will have a channel bandwidth of 25 kHz. These 25 kHz allotments have been characterized as "Technology Neutral" and flexible enough to accommodate multiple 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 within the county area where it was originally approved, if it meets co- and adjacent channel interference criteria. Region 24 will utilize **"county areas"** as guidelines for channel implementation with the area of Region 24. The definition of **"county area"** in this plan is the geographical/political boundaries of a given county, plus a distance of up to 15 miles outside of the county. If the channel, or a portion of a channel, is being moved into a "county area" that is within 30 miles of an adjacent region, Region 24 will receive concurrence from the affected region. By extending the "county area" by a designated distance, it is anticipated this will increase the possibility that orphaned channel remainders will still be able to be utilized within the "county area" , and reduce the potential for channel remainders to be forced to lay dormant and used with a county channel allotment. These movements will be documented on the National Public Safety Telecommunications Council CAPRAD database.

If the "orphaned channel" remainder does not meet co-channel and adjacent channel interference criteria by moving it within the "county area" as listed above, and it is determined by the region that the "orphaned channel" cannot be utilized in the region without exceeding the distance described in the "county area" listed above, Region 24 will submit a plan amendment to the FCC to repack the channel to a location where its potential use will maintain maximum spectral efficiency. This FCC plan amendment will require affected region concurrence.

When in the best interest of public safety communications and efficient spectrum use within the Region, the Region 24 Regional Planning Committee shall have the authority to move orphan channel allotments, and/or co-/adjacent-channel allotments affected by the movement of orphan channels, within its "county areas", which are defined above. This is to retain spectrum efficiency and/or minimize co-channel or adjacent channel interference between existing allotments within the region utilizing disparate bandwidths and technologies.

6.4 System Implementation

TV station KSMO, located in Kansas City, Missouri utilizes analog TV channel 62. Channel 62 is adjacent to 700 MHz public safety allocations and the frequency sort in the Kansas City area of Region 24 will include channels that can co-exist with TV channel 62 and channels that cannot to prepare for implementation when the KSMO has left the band. The Region 24 Regional Planning Committee will utilize NCC Implementation Subcommittee documentation titled **Appendix L "DTV Transition**" that will 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. All other areas in Region 24 (State of Missouri) are capable of immediately implementing systems using any 700 MHz public safety channels. With no restrictions in implementation due to incumbent co-channel broadcasters in the region, implementation of systems will adhere to guidelines in FCC rule 90.529 (b) and (c). An Agency may file a request with the Regional Chairperson for an extension of time to implement. The request should include all details describing why the agency has not implemented and a new implementation schedule. If necessary, the Regional Chairperson will call a special meeting to determine if the allotment should be extended or if the agency should reapply to the committee for another allotment.

7.0 Interoperability Channels

7.1 Introduction

The ability for agencies to effectively respond to mutual aid requests directly depends on their ability to communicate with each other. Missouri is subject to many natural disasters and contains regions and facilities, which may be susceptible to a man-made disaster or weapons of mass destruction attack. Mutual aid should be encouraged among agencies. This Plan seeks to facilitate the communications necessary for effective mutual aid.

The State of Missouri will administer the Missouri Statewide Interoperability Executive Committee; and the Missouri Statewide Interoperability Executive Committee (SIEC) under National Coordination Committee's (NCC) guidelines will administer the 700 MHz interoperability channels. The Region 24 700 MHz Regional Planning Committee will work with the Missouri State Interoperability Executive Committee and three (3) members of the Region 24 700 MHz Regional Planning Committee will participate in the Missouri State Interoperability Executive Committee (SIEC) representing Region 24. If at any time the State SIEC is unable to function in the role of administering the interoperability channels in the 700 MHz band, then this committee will assume this role and notify the FCC in writing of the change in administrative duties. See the NCC Implementation Subcommittees **Table of Interoperability Channels in Appendix "E"**

7.2 Tactical Channels

Due to the immediate availability of 700 MHz public safety channels in Missouri, Region 24 will not set aside additional channels for interoperability use within the region. It is anticipated the sixty-four FCC designated interoperability channels (6.25 KHz) will be sufficient to provide interoperability (voice and data) within Region 24.

All mobile and portable units operating under this Plan and utilizing 700 MHz channels must be programmed with the minimum number of channels called for either in NCC guidelines or as the Missouri State interoperability Executive Committee specifies. The channel display in these radios will be in accordance with the NCC guidelines that have common alphanumeric nomenclature to avoid any misinterpretation of use within Region 24. The Missouri SIEC is the final authority, in Missouri, on the interpretation of the distribution of the 700 MHz interoperability channels.

7.3 Deployable Systems

In this Plan, Region 24 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 areas while still providing mission critical functionalities as the Region 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 tuned to 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 SIEC will develop the operational details for deploying these systems.

It is expected that the tactical channels set aside for trunked operation will be heavily used by deployable systems. Therefore, the tactical channels cannot be assigned to augment general use trunked systems.

7.4 Monitoring of Calling Channels

700 MHz General Use channel licensees will be responsible for monitoring interoperable calling channels. The SIEC will develop operational guidelines for this function. **Appendix E** will include NCC documents that display required Interoperability guidelines.

8.0 Future Planning

The CAPRAD pre-coordination database has developed channel allotments in each county area within Missouri, including the City of St Louis using criteria such as current population, 2010 Census data, height above average terrain (HAAT) and public safety use curves generated by the Public Safety Wireless Advisory Committee (PSWAC) to provide spectrally efficient frequency allotments.

8.1 Inter-Regional Dispute Resolution Process

In the event that a dispute arises between Region 24 and an adjacent Region or Regions, regarding spectrum allocations or implementation, that cannot be resolved within 60 days, the parties to the dispute will request a hearing by the National Regional Planning Oversight Committee. **See Appendix H for details and Inter-Regional Dispute Resolution Agreements signed by adjacent Regions 4,13,15,16,17,26,34, and 39.**

9.0 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 January 14, 2003 Regional Planning meeting.
Stephen T. Devine

Chairman, Region 24

Appendices

Appendix A
Bylaws of the 700 MHz Regional Planning Committee-Region 24 (State of Missouri)
Revised September 16, 2002
BYLAWS OF REGION 24

NAME & PURPOSE

1.1 Name and purpose. The name of this Region shall be Region 24-Regional Planning Committee. Its primary purpose is to foster and promote cooperation, planning, development and evolution of Regional Plans and the implementation of these plans in the 700 MHz Public Safety Band within the State of Missouri.

MEMBERS

For purposes of this document, the term "member," unless otherwise specified, refers to both voting
and non-voting members.

2.1 Numbers, Election and Qualification. The Regional 24 700 MHz Regional Planning Committee shall have two classes of members, "voting members" and "non-voting members." New members may be added at annual, special, or regular meetings. Tools to promote participation and involvement in the Region 24 700 MHz Committee in the form of a list-serve and/or regional newsletters will be researched by the committee. The newsletter may be distributed both electronically and in print form.

Voting Members. Voting members shall consist of one (1) representative from any single agency engaged in public safety eligible to hold a license under 47 CFR 90.20, 47 CFR 90.523 or 47 CFR 2.103. Except that a single agency shall be allowed no more than one vote for each distinct eligibility category (e.g. police, fire, EMS, highway) within the agency's organization or political jurisdiction. In voting on any issue, the individual must identify himself/herself and the agency and eligibility category in which he or she represents. **Voting members may not vote on issues involving their entity. To become a member of Region 24 700 MHz Regional Planning Committee to represent their agency, a representative simply has to attend a**

meeting. See attendance and voting rights procedures below.
Non-Voting Members. Non-voting members are all other non-public safety personnel interested in furthering the goals of public safety communications.
2.2 Tenure. In general, 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 these bylaws, the members shall have such other powers and rights as the membership may determine.
2.4 Suspensions and Removal. A representative may be suspended or removed with cause by vote of a majority of members after reasonable notice and opportunity to be heard. Region 24 will hold at least two (2) meetings in a calendar year. To retain consistent voting rights, members should attend one (1) meeting in a 24-month period**. After the date of approval of this Regional Plan by the Federal Communications Commission, all previous attendees are voting members, with the exception of non-voting commercial members. After the acceptance of this Regional Plan, voting members that do not attend one meeting in a 24-month period that starts on the date of plan acceptance, will lose Region 24 voting rights for either a 6 month period or when the member attends the next Regional Planning Committee meeting, whichever comes first. Attending a meeting is all that is required to immediately reinstate voting members voting rights**. The loss of voting rights does not remove a member from active status; it simply requires attendance at a meeting (Special or Regular) to reinstate voting privileges. The voting limitations of an individual have no effect on the voting ability of a public safety entity. The public safety entity reserves the right to send another representative to vote on issues regarding 700 MHz implementation, or send the original voting representative to the next special or regular meeting.
A vote of the committee is the final determining factor regarding removal a member from Region 24. A period of 6 months from the first day of removal is required before a removed member is eligible for reinstatement for membership in the Regional Planning Committee.
2.5 Resignation. A member may resign by delivering written resignation to the chairman, vicechairman,
treasurer or secretary of the Regional Committee or to a meeting of the members. A resigning member is eligible for reinstatement to the Regional Planning Committee after a period of six months has lapsed, beginning on the first day of resignation.
2.6 Meetings. After Regional Plan approval, the Region 24 700 MHz Planning Committee will meet no less than two (2) times every twelve (12) months. **One meeting in each calendar year may be held in Jefferson City, Missouri. This is centrally located within Region 24 and will provide the maximum opportunity for regional participation. The remaining meeting(s) are to be located in a different city or town within the Region to attract and promote involvement in the committee decided on by members of the committee.**
Committee meetings will not be held on holidays or weekend days, unless called by the Region 24 Chairperson. At any time and when deemed necessary by the Chairperson, an additional meeting of the Region 24 Regional Planning Committee may be called. Video and/or Audio Teleconferencing may be conducted at meetings to include as many people as possible in the 700 MHz allocation process. The use of electronic E-mail and the Region 24 list-servers (**RPC24@yahoogroups.com, region24siec@yahoogroups.com and NPSPACregion24@yahoogrous.com**) will be utilized by members and officers of Region 24

as needed to convey regional issues at hand. **It should be noted the use of E-mail and/or video-audio teleconferencing does not remove the voting eligibility requirement of the member to attend at least one (1) of the Region 24 annual meetings.**

2.7 Special Meetings. **The Chairperson has the authority to call a meeting of the Regional Planning Committee when he deems it in the best interest of the Region and will provide notice of the special meeting to existing members of the Region (and the public) at least 5 days prior to the meeting.** Special meetings of the members may be held at any time and at any place within the Regional Committee area. Special meetings of the members may be called by the chairman or by the vice-chairman, or in case of death, absence, incapacity, by any other officer or, upon written application of two or more members.

2.8 Call and Notice.

A. Semi Annual meetings. Reasonable notice of the time and place of scheduled meetings of the members, not being less than 60 days, shall be given to each member. Such notice may specify the purposes of a meeting, but will specify meeting content if required by law or these bylaws or unless there is to be considered at the meeting (i) amendments to these bylaws or (ii) removal or suspension of a member who is an officer. Announcements of meetings, stating the time and place where the meeting is to be held, may be published in newspapers and land mobile radio periodicals. **In addition, a press release may be issued, urging parties interested in public safety communications to attend**. **Region 24 is will notify the Federal Communications Commission, Chief of the Wireless Telecommunications Bureau, when a meeting time and place has been established for the Region 24 700 MHz Regional Planning Committee**.

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 five days or by e-mail/facsimile at least three days before any special meetings, 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 three days before the meeting.

2.9 Quorum. **At any meeting of the members, a majority of the officers and a minimum of at**

least three (3) voting members 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.

2.10 Action by Vote. Each voting member, representing a particular agency (one vote per agency)

shall have one vote; non-voting members have no voting rights. When a quorum is present at any meeting, a majority of the votes properly cast by voting members present shall decide any question, including election to any office, unless otherwise provided by law or these bylaws.

2.11 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.**

2.12 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 before being noted with the secretary or other person responsible for recording the proceedings of the meeting. **A**

RPC member present via teleconference (audio or video) shall have voting status parallel to a member present at the meeting. **If the facility is unable to accommodate teleconferencing (audio or video), or for any other reason teleconferencing cannot be accommodated in the meeting place, it is the responsibility of the member to attend the meeting in person or to vote by written proxy to have full voting rights.** Unless otherwise specifically limited by their terms, such proxies shall entitle the holders thereof to vote at any adjournment of the meeting for which the proxy exists and the proxy shall terminate after the final adjournment of such meeting.

2.13 Voting on One's Own Application. At no time can a voting member vote on his/her application.

2.14 Special Interest Voting. A voting member **cannot** have a commercial interest in any of his/her Region and/or adjacent Region's application(s) on which he/she is reviewing, approving and/or voting.

OFFICERS AND AGENTS

3.1 Number and qualification. The officers of the Region 24 700 MHz Regional Planning Committee shall consist of a chairman, a vice-chairman and a secretary. All officers must be voting members of the Regional Committee.

3.2 Election. The officers shall be elected by the voting members at their first meeting and, thereafter, at a meeting determined by the membership. The terms of the officers in the Region 24 700 MHz RPC will be for two (2) years. In order to allow for consistency in the plan creation and initialization process, the terms of elected officers will begin on the date of the FCC's approval of the Region 24 plan.

3.3 Tenure. The officers shall each hold office until the biannual election meeting of the members held within two years 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.

3.4 Chairman and Vice 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. The Vice Chairman, if any, shall have such duties and powers, as the voting members shall determine. The Vice-Chairman shall have and may exercise all the powers and duties of the chairman during the absence of the chairman or in the event of his or her inability to act.

3.5 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. **In the absence of a treasurer within the Region 24 700 MHz Planning Committee, the Chairperson shall assign Region 24 treasurer duties as deemed necessary.**

3.6 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. In the absence of a secretary within the Region 24 700 MHz Planning Committee, the Chairperson shall assign Region 24 Secretary duties as deemed necessary.

3.7 Suspensions or Removal. An officer of the Region 24 Regional Planning Committee may be suspended with cause by vote of a majority of the voting members in attendance.

3.8 Resignation. An officer may resign by delivering his or her written resignation to the chairman,
vice-chairman, treasurer, or secretary 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.

3.9 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, vice chairman, treasurer and clerk until his or her successor is elected and qualified, or in each case until he or she sooner dies, resigns, is removed or become disqualified.

AMENDMENTS

These bylaws may be altered, amended or repealed in whole or in part by vote. The voting members may by a two-thirds vote of a quorum, alter, amend, or repeal any bylaws adopted by the
Regional Committee members or otherwise adopt, alter, amend or repeal any provision which FCC
regulation or these bylaws requires action by the voting members.

DISSOLUTION

This Regional Committee may be dissolved by the consent of two-thirds plus one of an assembled
quorum of the membership at a special meeting called for such purpose. The FCC shall be notified
.

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 1990 edition, ninth edition, Sarah Corbin Robert, Henry M. Robert III, and William J. Evans.

Appendix B
Region 24 member list and Contact information

Peter Albera
Motorola C&E, Inc.
1129 SW Sunflower Dr.
Lee's Summit MO 64081
816-246-1350
peter.albera@motorola.com
(Commercial/ Non-voting)
William Bauer

North Central Fire Alarm
101 E Maple St.
Wentzville MO 63385
Tim Bechler
Central County E9-1-1
22 Weis Av
Ellisville MO 63011
636-207-7911
tim@cce911.org
Rick Bennett
Missouri Department of Transportation
2211 St. Mary's Blvd
Jefferson City MO 65102
573-526-4842
richard.bennett@modot.mo.gov
James C. Biggerstaff, Director
Missouri State Highway Patrol
1510 East Elm St.
Jefferson City MO 65101
573-526-6100
Scott Bigham
Missouri State Highway Patrol
P.O. Box 3756
Kirkwood MO 63122
Ed Brundage
Kansas City Police Department
1125 Locust St
Kansas City MO 64106
816-234-5000
ebrunadge@kcpd.org
Norman Buehre
Clayton Fire Department
10 N Bemiston Av
Clayton MO 63105
nbuehre@ci.clayton.mo.us
Terry Buhr
Motorola C&E, Inc.
5691 Sunnywood Drive
Cedar Hill MO 63106
636-274-4986
(Commercial/ Non-voting)
William Cade
Jasper County 911
13870 Dispatch Lane
Carthage MO 64836
417-358-7000

417-359-9116
911@jasco.org
Rex Capen
City of Joplin
303 East Third St
Joplin MO 64801
417-624-0820
rcapen@joplin.mo.org
David Cerqua
M/A-Com
8105 N Beltline Rd., Ste. 170
Irving TX 75063
972-550-2323
972-550-2364
(Commercial/ Non-voting)
Jonathan Chaney
Missouri State Highway Patrol
P.O. Box 3756
Kirkwood MO 63122
314-340-4000
Fax 314 340 4010
Michael Clinard
St. Peters Police Department
1020 Kimberley Dr.
St. Peters MO 63376
636-477-6600
Chuck Collins
Springfield/ Greene County Emergency Communications Department
319 East Chestnut Expressway
Springfield MO 65802
417-864-1708
417-864-1824
Tom Dailey
Kansas City Police Department
1125 Locust St
Kansas City MO 64106
816-234-5000
tadiley@kcpd.org
Stephen T. Devine, Chair
Missouri State Highway Patrol
1510 East Elm St.
Jefferson City MO 65101
573-526-6105
573-526-1112
steve.devine@mshp.dps.mo.gov
John Diggs

Missouri Department of Transportation
105 W Capitol Av
Jefferson City MO 65102
573-526-0125
john.diggs@modot.mo.gov
Tom Dollus
Missouri Department of Transportation
105 W Capitol Av
Jefferson City MO 65102
Kent Forde
Valle Ambulance District
P.O. Box 460
DeSoto MO 63020
636-586-2312
636-337-0808
David Funk
NLECTC
2050 E. Iliff Ave
Denver, Colorado 80208
dafunk@du.edu
303 871 2439
Charles Gastler
St. Louis Metropolitan Police Department
1200 Clark Av
St. Louis MO 63103
314-444-5993
314-444-2919
cdgastler@slmpd.org
David Gelyana
RCC Consulting
515 Newtown Drive
Buffalo Grove IL 60089
dgelyana@rcc.com
(Commercial/ Non-voting)
Pam Gilligan
Jefferson City Police Department
401 Monroe
Jefferson City MO 65101
573 634 6400
leadop@jeffcitymo.org
William Harlan
St. Louis County Police Department
7900 Forsyth Blvd.
Clayton MO 63105
314 6t15 3562
Bill Holcomb

Commenco
4901 Bristol Av
Kansas City MO 64129
816-753-2166
billh@commenco.com
(Commercial/ Non-voting)
Drew Juden
City of Sikeston
215 N New Madrid
Sikeston MO 63801
573-471-6200
drewj@sikeston.org
Thomas Kearns
M/A-Com
15511 W 89th Terrace
Lenexa KS 66291
913-541-8146
tkearns@discoverynet.com
(Commercial/ Non-voting)
Doug Keeney
Jefferson City Police Department
401 Monroe
Jefferson City MO 65101
573 634 6400
dkeeney@jeffcitymo.org
Keith Kemmerline
Motorola C&E, Inc.
2995 Telber Ct.
Stow OH 44224
330-678-0960
(Commercial/ Non-voting)
Ronald Kronenberger, Nextel
One City Place Drive, Suite # 100
St Louis, MO 63141
314 568 4550
Fax 314 787 3501
ronald.kronenberger@nextel.com
(Commercial/ Non-voting)
Robert Lawery
Kansas City Police Department
1125 Locust St
Kansas City MO 64106
816-234-5000
rlawrey@kcpd.org
James A. Lundsted
Missouri State Highway Patrol

1510 East Elm St.
Jefferson City MO 65101
573-526-6104
Paul Luttrell
City of Joplin
303 East Third St
Joplin MO 64801
417-624-0820
pluttrell@joplin.mo.org
Steven J. Makky, Sr., Vice-Chair
St. Charles County Government
301 N Second St., Rm. 280
St. Charles MO 63301-5410
636-949-3031
636-949-3021
smakky@saintcharlescounty.org
Jon Martin
Motorola C&E, Inc.
1292 Poseidon Ct
St. Peters MO 63367
636-970-7904
636-279-3309
jon.martin@motorola.com
(Commercial/ Non-voting)
Tony Martinez
Communications Associates
3343 S Scenic
Springfield MO 65807
417 882 1401
tony@commassocradio.com
(Commercial/ Non-voting)
Pat McKenzie
Kansas City Police Department
1125 Locust St
Kansas City MO 64106
816-234-5000
pmckenzie@kcpd.org
Joe Moncado
M/A-Com
15745 W Beckett Lane
Olathe KS 66062
913-764-0026
913-599-6280
(Commercial/ Non-voting)
Sharon Murray
Republic Police Department

540 Civic Blvd
Republic MO 65738
417-732-2642
Jim Nesselrode
Commenco
4901 Bristol Av
Kansas City MO 64129
816-753-2166
ness@commenco.com
(Commercial/ Non-voting)
Chad Powelson
Commenco
4901 Bristol Av
Kansas City MO 64129
816-753-2166
chad@commenco.com
(Commercial/ Non-voting)
Karen Raines
Federal Communications Commission-Kansas city Field Office
520 NE Colbern Rd, 2 FL
Lee's Summit MO 64086
816-316-1256
kraines@fcc.gov
(Honorary/ Non-Voting)
Tim Raymer
Missouri Department of Health & Senior Services
P.O. Box 570
Jefferson City MO 65102
573-526-7387
raymet@dss.mo.gov
Michael Redman
St. Louis County Police Department
7900 Forsyth Blvd.
Clayton MO 63105
314 615 5362

Kurt Rellergert, Motorola C&E,
4 Gills Inn Drive
O'Fallon MO 63366
636-240-9315
kurtis.rellergert@motorola.com
Stephen Richey
St. Joseph Fire Department
401 S 7th St.
St. Joseph MO 64501

816-271-4603
srichey@ci-st-joseph.mo.us
Bette Rinehart
Motorola C&E, Inc.
28 Twin Lakes Drive
Gettysburg PA 17325
c18923@email.mot.com
(Commercial/ Non-voting)
Daniel Rowden
St. Charles County Department of Dispatch & Alarm
1605 Wentzville Parkway
Wentzville MO 63385
636-949-3018
636-949-7328
drowden@saintcharlescounty.org
Steve Ruskin
M/A-Com
9100 East Panorama Dr., Ste. 200
Englewood CO 80112
303-980-3022
303-980-3039
sruskin@tycoelectronics.com
(Commercial/ Non-voting)
Ron Shook-Retired
Greene County
833 Boonville
Springfield MO 65802
417-869-6040
rshook@greenecounty.org
Steve Sloan
Missouri State Emergency Management Agency
2302 Militia Drive
Jefferson City MO 65102
573-526-9144
steve.sloan@sema.dps.mo.gov
Robert Speidel
M/A-Com
P.O. Box 2000;
221 Jefferson Ridge Pkwy
Lynchburg VA 24501
434-455-9465
434-455-6764
speidelbo@tycoelectronics.com
(Commercial/ Non-voting)
Roger Strope, Chief Projects Engineer
Missouri State Highway Patrol

1510 East Elm St.
Jefferson City MO 65101
573-526-6104
Richard Stump, Communications Officer
Missouri State Emergency Management Agency
2302 Militia Drive
Jefferson City MO 65102
573-526-9201
richard.stump@sema.dps.mo.gov
Reg Swan
Johnson Communications Service/ Tel-Link
1606 North Kingshighway
Cape Girardeau MO 63701
573-335-5555
regswan@jcstel.com
(Commercial/ Non-voting)
Chris Teel
Springfield/ Greene County 9-1-1
319 East Chestnut Expressway
Springfield MO 65802
417-864-1708
417-864-1824
Michael Turner
Central County E9-1-1
22 Weis Av
Ellisville MO 63011
636-207-7911
mturner@cce911.org
T.J. Ward
State of Illinois
531 Sangamon Av
Springfield IL 62702
217-782-5742
217-524-4396
wardt@apco911.org
(Honorary/ Non-Voting)
J.R.Webb
Springfield/ Greene County 9-1-1
319 East Chestnut Expressway
Springfield MO 65802
417-874-1222
417-864-1572
jrwebb@ci.springfield.mo.us
Tom White, Director
Cooper County Emergency Management
200 Main Street

Boonville MO 65233
660-882-2614
660-882-2610
ema@undata.com
David Wunderlin
Radio Communications Specialists
1122 Illinois, Ste. 104
Joplin MO 64801
417-781-3797
417-781-8631
rcs@rcsonline.net
(Commercial/ Non-voting)
Chuck Zang
Kansas City Fire Department
635 Woodland Av, Suite 2100
Kansas City MO 64106
816-784-9200
816-784-9230
chuck_zang@kcmo.org
Rodney Zerr
St. Charles County Emergency Management Agency
301 N Second St., Rm. 280
St. Charles MO 63301-5410
636-949-3023
636-949-3021
rzerr@saintcharlescounty.org

Meeting attendees by meeting

June 7, 2000 Jefferson City, Missouri
Attendees
Stephen T. Devine, Patrol Frequency Coordinator, Missouri State Highway Patrol, 800 MHz NPSPAC Chairperson
Michael Redman, Communications Coordinator, St Louis County Police
Ron Shook, Emergency Management Agency, Greene County Missouri
William Cade, Jasper County 911, Jasper County Missouri
Chris Teel, Springfield/Greene County 911, Springfield, Missouri
J.R. Webb, Greene County Missouri Sheriff's Office
James C. Biggerstaff, Director of Radio, Missouri State Highway Patrol
James A. Lundsted, Chief Projects Engineer, Missouri State Highway Patrol
Charles Gastler, Communications Manager, St Louis Metropolitan Police Department

October 5, 2000 Jefferson City, Missouri
Ron Shook, Convenor, Greene County Emergency Management
Stephen T. Devine, (Elected Chairperson at meeting)
J.R. Webb, Greene County Sheriff's Office
Chuck Collins, Springfield/Greene County Emergency Communications Department

Charles Gastler, St Louis Metropolitan Police Department
James C. Biggerstaff, Director of Radio, Missouri State Highway Patrol
Michael Redman, Communications Coordinator, St Louis police
Steve Makky Sr. St Charles County Government
William Cade, Jasper County 911, Jasper County Missouri
Chris Teel, Springfield/Greene County 911
James A. Lundsted, Chief Projects Engineer, Missouri State Highway Patrol

January 11, 2001(St Louis County, Missouri)
Stephen Devine, Missouri State Highway Patrol-Chairperson
Jonathan Chaney, Missouri State Highway Patrol-St Louis
Scott Bigham, Missouri State Highway Patrol-St Louis
Rodney Zerr, St Charles County Emergency Management
Steven Makky Sr. St Charles County Emergency Management
Tom Dollus, Missouri Department of Transportation
Tim Bechler, Central St Louis County Fire Alarm/911
Roger Strope, Chief Projects Engineer, Missouri State Highway Patrol
Richard Stump, Communications Officer, Missouri State Emergency Management Agency
Dan Rowden, Director, St Charles County Department of Dispatch
Sgt. Mike Clinnard, St Peters Police Department
David Wunderlin, Radio Communications Specialists, Joplin, Missouri
William Cade, Jasper County 911, Jasper County, Missouri
Terry Buhr, Motorola
Jon Martin, Motorola
Keith Kemmerline, Motorola
Drew Juden, City of Sikeston, Missouri
Michael Redman, Communications Coordinator, St Louis County Police Department
William Bauer, North St Louis County Fire Alarm,
Tom Kearns, Com-Net Ericsson
Tom Ward, State of Illinois
Kent Forde, Valle Ambulance District, Jefferson County, Missouri
Lt William Harlan, St Louis County Police
Charles Gastler, St Louis Metropolitan Police Department

March 29, 2001 (Springfield, Missouri)
Ron Shook, Greene Co. EMA
J.R. Webb, Greene Co. Sheriff's Dep't.
Stephen T. Devine, Chairperson, Missouri State Highway Patrol
Pete Albera, Motorola C&E, Inc.
Bill Cade, Jasper County E9-1-1
Sharon Murray, Republic Police Department
Steve Sloan, Missouri State Emergency Management Agency
Steve Makky, Sr., St. Charles County Emergency Management
Mike Turner, Central County E9-1-1 (St. Louis Co.)

June 28, 2001 Jefferson City, Missouri

Stephen T. Devine, Chairperson, Missouri State Highway Patrol
Charles Gastler, St Louis Metropolitan Police Department
Tom Kearns, MA/COM Wireless
Kurt Rellagert, Motorola
Pete Albera, Motorola
J.R. Webb, Greene County Sheriff's Department, Greene County, Missouri
Ron Shook, Greene County Emergency Management
James C. Biggerstaff, Director of Radio, Missouri State Highway Patrol

September 18, 2001, Branson, Missouri
Stephen T. Devine - MSHP - RPC Chairperson/ Chair Implementation Subcommittee
Steve Makky, Sr. - SCCG/ EMA - RPC Secretary/ Chair Technology Subcommittee
Mike Turner - Central [St. Louis] County E9-1-1
Terry Buhr - Motorola
Charles Gastler - St. Louis Metropolitan Police Department
Tom Kearns - M/A Com Wireless
J.R. Webb - Greene Co. Sheriff's Office
Roger Strope - Missouri State Highway Patrol
Peter Albera - Motorola
Ed Brundage - Kansas City, Mo. Police Department
Chuck Zang - Kansas City, Mo. Fire Department
David Cerqua - M/A Com Wireless

January 10, 2002 Jefferson City, Missouri
Tom Kearns - M/A Com - kearnsth@tycoelectronics.com
Joe Mancato - M/A Com - e-mail not given
Pete Albera - Motorola - peter.albera@motorola.com
Jon Martin - Motorola - jon.martin@motorola.com
Roger Strope - MSHP - stropr@mshp.state.mo.us
Stephen T. Devine - Chairperson, MSHP - devins@mshp.state.mo.us
Ed Brundage - Kansas City Police Department - ebrundage@kcpd.org
Chuck Zang - Kansas City Fire Department - chuck_zang@kcmo.org
Bob Lawrey - Kansas City Police Department - rlawrey@kcpd.org
Chuck Gastler - St. Louis Metropolitan Police Department - cdgastler@slmpd.org
Jim Lundsted - Missouri Department of Conservation - jlundste@mail.state.mo.us
Steve Makky, Sr. - St. Charles County - smakky@pipeline.com

April 11, 2002 Kansas City, Missouri
Those in attendance:
Stephen T. Devine, MSHP sdevine@mail.state.mo.us
Steven J. Makky, Sr., St. Charles County, Mo smakky@pipeline.com
Stephen Richey, Fire Chief, St. Joseph, Mo srichey@ci.st-joseph.mo.us
Jon Martin, Motorola jon.martin@motorola.com
Bob Speidel, Tyco M/A Com speidelbo@tycoelectronics.com
Tom Kearns, Tyco M/A Com kearnsth@tycoelectronics.com
Chuck Zang, Kansas City Fire Dept. chuck_zang@kcmo.org

Robert Lawrey, Kansas City Police rlawrey@kcpd.org
Tom Dailey, Kansas City Police tdailey@kcpd.org
Ed Brundage, Kansas City Police ebrundage@kcpd.org
Pat McKenzie, Kansas City Police pmckenzie@kcpd.org
Jim Nesselrobe, Commenco, Inc. ness@commenco.com
Chad Powelson, Commenco, Inc. chad@commenco.com

September 24, 2002 Jefferson City
Stephen Devine, Chairperson, MSHP sdevine@mail.state.mo.us
Steve Makky, Sr. St Charles County EMA smakky@pipeline.com
Richard Stump, MO SEMA rstump@mail.state.mo.us
Karen Raines, FCC kraines@fcc.gov
Ron Shook, Greene County rshook@greencounty.org
Tom Kearns, MA/COM kearnsth@tycoelectronics.com
Robert Speidel, MA/COM speidelbo@tycoelectronics.com
J.R. Webb jrwebb@ci.springfield.mo.us
Paul Luttrell, Joplin, Mo pluttrel@joplinmo.org
David Gleyana, RCC Consultants dgelyana@rcc.com
Ed Brundage, KCPD ebrundage@kcpd.org
Bob Lowery rlawrey@kcpd.org
Pete Albera, Motorola peter.albera@motorola.com
January 14, 2003 Jefferson City, Missouri
Stephen Devine sdevine@mail.state.mo.us MSHP
Steve Makky, Sr. smakky@pipeline.com St Charles County EMA
Roger Strope stropr@mshp.state.mo.us MSHP
Norman Buehre nbuehre@ci.clayton.mo.us City of Clayton
Rick Bennett benner1@mail.modot.state.mo.us Missouri DOT
John Diggs diggsj@mail.modot.state.mo.us Missouri DOT
Richard Stump rstump@mail.state.mo.us State Emergency Management
J.R. Webb jrwebb@ci.springfield.mo.us City of Springfield, Missouri
Dan Rowden drowden@win.org St Charles County Fire Alarm
Tom Kearns kearnsth@tycoelectronics.com MA/COM
Steve Ruskin ruskinst@tycoelectronics.com MA/COM
Ed Brundage ebrundage@kcpd.org Kansas City Police Dept
Karen Raines kraines@fcc.gov FCC Enforcement Bureau-KC
Drew Juden drewj@sikeston.org City of Sikeston
Reg Swan regswan@jcstel.com JCS Tel Link
Peter Albera peter.albera@motorola.com Motorola
Kurt Rellergert kurtis.rellergert@motorola.com Motorola
Jon Martin jon.martin@motorola.com Motorola
Paul Luttrell pluttrel@joplinmo.org City of Joplin
Rex Capen rcapen@joplinmo.org City of Joplin
Bette Rinehart c18923@email.mot.com Motorola
Tom White ema@undata.com Cooper County, Missouri
Ron Shook rshook@greencounty.org Greene County EMA

July 1, 2003, Jefferson City, Missouri
Stephen T. Devine, Chair devins@mshp.state.mo.us MSHP
Roger Strope stropr@mshp.state.mo.us MSHP
Tim Raymer raymet@dhss.state.mo.us MO Div of Health-Human Services
J.R. Webb jrwebb@ci.springfield.mo.us Springfield-Greene County 911
Bill Holcomb billh@commenco.com Commenco
Peter Albera peter.albera@motorola.com Motorola
Jon Martin jon.martin@motorola.com Motorola
Richard Stump rstump@mail.state.mo.us MO State Emergency Management
Karen Raines kraines@fcc.gov FCC Kansas City Field Office
Steve Makky, Sr, Secretary/Vice Chair smakky@ka2otd.org St Charles County

December 8, 2004 St Louis City Police Department
Jon Martin jon.martin@motorola.com Motorola
Ron Kronenberger ronald.kronenberger@nextel.com Nextel
Pam Gilligan leadop@jeffcitymo.org Jefferson City Police Dept
Roger Strope roger.strope@mshp.dps.mo.gov Missouri State Highway Patrol
Charles Gastler cdgastler@slmpd.org St Louis City Police Department
David Funk dafunk@du.edu NLECTC
Steve Devine steve.devine@mshp.dps.mo.gov Missouri State Highway Patrol
Steve Ruskin ruskinst@tycoelectronics.com MA/COM
Tony Martinez tony@commassocradio.com Communications Associates
Douglas Keeney dkeeney@jeffcitymo.org Jefferson City Police Dept
.

Appendix C

List of counties areas within Region 24:
Note: The City of St Louis is the only city in the State of Missouri that is not located within a Missouri county and it has an individual allotment. Pool channel allotments are allotted by "County Areas" in Region 24. County areas and their definitions are listed in Section 6.3
Adair
Andrew
Atchison
Audrain
Barry
Barton
Bates
Benton
Bollinger
Boone
Buchanan
Butler
Caldwell
Callaway
Camden
Cape Girardeau
Carroll

Carter
Cass
Cedar
Chariton
Christian
Clark
Clay
Clinton
Cole
Cooper
Crawford
Dade
Dallas
Daviess
Dekalb
Dent
Douglas
Dunklin
Franklin
Gasconade
Gentry
Greene
Grundy
Harrison
Henry
Hickory
Holt
Howard
Howell
Iron
Jackson
Jasper
Jefferson
Johnson
Knox
Laclede
Lafayette
Lawrence
Lewis
Lincoln
Linn
Livingston
Macon
Madison
Maries
Marion

McDonald
Mercer
Miller
Mississippi
Moniteau
Monroe
Montgomery
Morgan
New Madrid
Newton
Nodaway
Oregon
Osage
Ozark
Pemiscot
Perry
Pettis
Phelps
Pike
Platte
Polk
Pulaski
Putnam
Ralls
Randolph
Ray
Reynolds
Ripley
Saline
Schuyler
Scotland
Scott
Shannon
Shelby
St. Charles
St. Louis
St. Francois
St. Clair
Ste. Genevieve
Stoddard
Stone
Sullivan
Taney
Texas
Vernon
Warren

Washington
Wayne
Webster
Worth
Wright

Appendix D

Meeting attendance, agendas and other events where 700MHz information was disseminated.

June 7, 2000
800 MHz NPSPAC Regional Planning Committee meeting in Jefferson City, Missouri
Called by Acting Chairperson of 800 MHz NPSPAC Region Stephen Devine, who is standing in for Mr. John Gerke, as he withdrew from the 800 MHz Chair due to ill health, elected Chairperson of 800 MHz Committee. FCC Wireless Bureau notified.
Meeting topics included discussion of Region 24's status, the appointment of a new Regional Chairperson and a review of national planning requirements. A discussion of the upcoming 700 MHz public safety spectrum was introduced and the Chairperson advised the committee he would be appointing a convener. Letter from Chairperson Stephen T. Devine to Chief of the Wireless Telecommunications Bureau dated June 12, 2000 prematurely stated that Stephen Devine was named convener of the 700 MHz Region 24 Planning Committee. This did not allow for enough notice between meeting announcement and initial meeting per FCC issued guidelines.

July 1, 2000
800 MHz Region 24 Chairperson Stephen T. Devine appoints Ron Shook of Emergency Management, Greene County, Missouri Convener of the 700 MHz Regional Planning Committee and sets first meeting date for October 5, thereby allowing 90 days notice of first meeting. FCC Wireless Bureau notified of the appointment of Convener in letter to Chief dated October 6, 2000.
Convener Ron Shook, Greene County, Missouri Emergency Management
940 Booneville Road, Springfield, Missouri 65802
Work phone 417 829 6209
E-mail rshook@greenecountymo.org

August 28, 2000
Missouri State Highway Patrol issues Press release for meeting dated August 28, 2000.
APCO notified of meeting announcement
FCC Wireless Bureau notified of announcement

October 5, 2000

Missouri State Highway Patrol issues Statewide teletype message announcing 700 MHz committee formation.

October 5, 2000
700 MHz Region 24 Planning Committee convened by Ron Shook of Greene County Emergency Management. 700 MHz Meeting began at 1145 hrs CDT. Stephen T. Devine, Missouri State Highway Patrol Frequency Coordinator was elected Chairperson of the 700 MHz Region 24 Planning Committee. The list of attendees were as follows:
Stephen T. Devine, Chairperson Region 24 800 MHz and Frequency Coordinator-Missouri State Highway Patrol
Michael Redman, St Louis County Police
Ron Shook, Convener, Greene County Emergency Management Agency
William Cade, Jasper County 911
Chris Teel, Springfield/Greene County 911
J.R. Webb, Greene County Sheriff's Office
James C. Biggerstaff, Director of Radio, Missouri State Highway Patrol
James A. Lundsted, Chief Projects Engineer, Missouri State Highway Patrol
Charles A. Gastler-Communications-St Louis Metropolitan Police
Steve Makky Sr. St Charles County Emergency Management
Meeting topics included election of 700 MHz Chairperson and approaching NCC to ask if meeting in the Midwest (St Louis or Kansas City, preferably) See letter to NCC DFO Michael Wilhelm dated June 12, 2000.

January 11, 2001
700 MHz Region 24 meeting schedule for January 11, 2001 in St Louis County Missouri at the St Louis County Emergency Operations Center, 14847 Olive Street Road, Chesterfield, Missouri beginning called to order at 11:30 by Chairperson Devine.

Missouri State Highway Patrol issues news release indicating date, time and meeting agenda of January 11 meeting to news media throughout Missouri and surrounding areas dated **November 7, 2000**. Copies of news release faxed to all APCO Frequency Coordinators in Missouri's eight (8) adjacent states on **December 13, 2000**.

MRT, Radio Resource magazine and the APCO magazine are all notified of the meeting date time and agenda. FCC Wireless Bureau also notified. A list of fire agencies within the St Louis area is obtained and 70 copies of the MSHP news release are faxed to the fire agencies making them aware of the meeting on **November 14, 2000**
A letter is sent to Region 13 (Southern Illinois) convener T.J. Ward to invite his participation in the meeting as they have begun the convening process and have areas of interest in southern Illinois adjacent to the area of the meeting. Meeting attendee list on file.
Meeting topics include updating NCC information, presentation on 700 MHz

band and frequency allotments (Interoperability, State license and General Use) and Regional Plan requirements

.

February 2-3, 2001

700 MHz Chairperson Stephen T. Devine gives two presentations at the Missouri State Emergency Management Agency Annual Communications Conference at the Inn at the Grand Glaize Hotel in Lake Ozark, Missouri. Information regarding the 700 MHz Regional Planning Committee in Region 24 was discussed and attendees were invited to the meeting in Springfield, Missouri set for March 29, 2001 and to participate in Region 24 700 MHz meetings.

March 29, 2001

700 MHz Regional Planning Committee Meeting convenes on March 29 in Springfield, Missouri at the Greene County Emergency Management Agency. Attendee list is on file.

Missouri State Highway Patrol issues Tele-type message statewide announced meeting date, time, location and agenda on **March 15, 2001**. Meeting topics include sub-committee formation (Interoperability, Implementation and Technology) and Election of Region 24 Committee Secretary.

Subcommittee Chairpersons elected:

Technology – Steve Makky, Sr. St Charles County Emergency Management

Interoperability – William Cade, Jasper County 911 (Ron Shook, Greene County Emergency Management)

Implementation – Stephen T. Devine, Missouri State Highway Patrol

Email sent to FCC Wireless Bureau and Radio Resource, MRT and APCO Magazine with meeting announcement including date, location and time of meeting.

FCC issues Public Notice (DA 01-343) on Region 24 meeting set for **March 29, 2001 on February 13, 2001.**

April 16, 2001

Region 24 Chairperson Stephen T. Devine attends the Missouri State Emergency Management Agency Annual Conference at Lake Ozark and attends Region 24 display table providing information on the 700 MHz planning committee that is formed within Missouri. A banner is used to advertise the Committee and questions from conference attendees are answered. The hours of the display table are 8 am through 2 pm.

June 28, 2001 Region 24 700 MHz Regional Planning Committee meeting is announced for June 28, 2001 at the Missouri State Highway Patrol Headquarters located at 1510 East Elm, Jefferson City, Missouri 65101. Attendee list is on file. Meeting convened at 12:39 PM. Meeting topics included discussed were several documents initiated by the NCC that are before the FCC, particularly

the NPSTC request to not allow commercial wireless providers to use high powered base stations in areas of commercial spectrum adjacent to public safety mobile users.

Missouri State Highway Patrol issues a news release announcing date, time and location **June 28, 2001** Region 24 700 MHz meeting.
FCC Wireless Bureau issues Public Notice (DA 01-1043) for meeting.
Radio Resource, MRT magazine and APCO magazine post meeting information for **June 28** meeting after receiving E-mail from Chairperson.
Other meeting topics include:
NCC standing documents,
Progress reports on NCC status
Region 24 planned use of the NPSTC pre-coordination database
Interference issues
Coordination licensing
Regional funding

July 27, 2001
The list-serve for Region 24 is rpc24@yahoogroups.com
It is a forum for members and other interested parties to exchange 700 MHz public safety information along with updated NCC information. The National Public safety Telecommunications Council created the website for the Region.

September 18, 2001
NPSPAC Region 24 held meetings at the Chateau on the Lake Resort in Branson, Missouri, which is the site of the Missouri APCO Chapter's annual conference. 700 MHz meeting topics included NCC progress updates, information from APCO Intl. National Conference in Salt Lake City which introduced a packing plan for General Use spectrum to be implemented on The NPSTC CAPRAD database.
The packing program establishes an average terrain within a county (or any geographic area) and then determines predicted coverage based on the 40-dBu contours. For co co-channel use, the 40-dBu contours can touch, but not overlap the 5-dBu contour of the co channel "victim" site. County boundaries will be used for coverage determination and terrain will be used for interference contours. This new packing technology is estimated to have a channel gain of five times that of the packing method employed for 800 MHz NPSPAC.
The topic of Canada's movement onto 700 MHz and its effect on states near Line A was discussed as well. The State of New York is leading an effort to intervene and negotiate with the Canadian government. Other issues discussed.

The Missouri State Highway Patrol issued a press release throughout Missouri on this 700 MHz Regional Planning Committee meeting on **August**

2, 2001
They also issued an announcement on the State Law Enforcement Teletype Network announcing the meeting and inviting all interested parties. Notices regarding this meeting were also posted in Radio Resource magazine, MRT magazine and the APCO Intl. magazine.
The Federal Communications Commissions Wireless Telecommunications Bureau issued a Public Notice (DA 01-1608) on July 6, 2001 announcing this meeting.
Minutes of meeting are on file
Next meeting set for January 10, 2002

January 10, 2002
Region 24 700 MHz Regional Planning Committee meeting was held at the Missouri State Highway Patrol General Headquarters in Jefferson City, Missouri on January 10, 2002 and was called to order at 0927 hrs.
An E mail message announcing the meeting for January 10, 2002 was sent to the FCC's WTB on 092701 to the Wireless Telecommunications Bureau (WTB), along with the previously mentioned trade publications, however there was no Public Notice issued by the WTB. This could have been due to the September 11 attacks. Topics of the Region 24 700 MHz meeting are as follows:
Acceptance of Bylaws of the Region 24 700 MHz Regional Plan
Final Decisions on content of the Regional Plan
Development of criteria needed for applicant eligibility
Update on NCC progress and current status of 700 MHz in Missouri along with Broadcaster issues.
Updates on CAPRAD database being developed by National Public Safety Telecommunications Council. Minutes of meeting are on file.
Next meeting set for April 11, 2002 in Kansas City, Missouri

April 11, 2002
Region 24 700 MHz Committee meeting was held in Kansas City, Missouri at the Kansas City Police Department Communications Office. FCC Public Notice DA 02-278 issued February 7, 2002. The Meeting minutes are on file.
A press release was issued by the State of Missouri indicating the date, time and location of the meeting on January 31, 2002. All major industry periodicals (Radio Resource Magazine, MFT Magazine and APCO-Public Safety Bulletin) were notified and posted the meeting announcement in their publications. Plan updates were discussed, as were anticipated channel allotment parameters for the CAPRAD database general Use channels. Also discussed were FCC designated Interoperability channels and how they would be implemented in the region.
The uncertainty of use for the interoperability data channels was a topic of discussion as was the future use of the 150 KHz channel aggregated data channels. Training for the CAPRAD database will be in June and Steve Makky of St Charles County Emergency Management, Chairman of

Technical Region 24 Subcommittee and Stephen Devine, Region 24 Chairperson will attend.
A discussion on the band plan and the location of the reserve channels adjacent to the designated interoperability channels needed for 25 KHz implementation ensued.
A short discussion of the Motorola Greenhouse project and adjacent TV channel 62 provided committee members an update on DTV transition.
Meeting adjourned with next meeting scheduled for
September 24, 2002

700 MHz Regional Committee meeting held at the State Emergency Management Agency at 10 am. Announcements were sent to Radio Resource Magazine, APCO Public Safety Magazine and MRT Magazine as well as the FCC's Wireless Bureau, announcing the meeting. The Missouri State Highway Patrol issued a news release to all the major news media in Missouri with details of the meeting including location, time and content. There was a discussion on the 700 MHz allotment process and how it would allot channels to each individual county area. It was also decided that the Regional Planning Committee Writing Group would create an allotment for the committee to review while waiting for the NPSTC CAPRAD channel packing plan was completed.
Wideband data standards were also discussed and several committee members commented on NCC preliminary channel loading figures that would require 180 users per 50 KHz wideband data channel. These figures are preliminary and will probably be revised when better information is available.

A meeting was called for **January 10, 2003** at 10 am in the State Emergency Management Agency. This meeting will be to review the Region 24 channel allotment from the CAPRAD/NPSTC packing plan and the packing plan created in by Region 24. A discussion on the benefits of each packing plan will be encouraged.
It is anticipated Regional Planning Committee members will take both plans to their respective regions for review and a second meeting, at the State Emergency Management Agency's Annual Communications Conference at the Tan Tara Resort on February 14, will be held. At this meeting, the Regional Plan will be reviewed in its entirety and the Regional Planning Committee will approve one of the channel allotment plans for Region 24.

January 14, 2003
The Region 24 Regional Planning Committee held a meeting on January 10, 2003 at 10 AM to review two potential channel packing plans for Region 24. The NYSTEC channel packing plan sponsored by the National Public Safety Telecommunications Council (NPSTC) was reviewed as was the packing plan created by members of the Region 24 Writing Group. A vote of the members present indicated the Regional Planning Committee

overwhelmingly supported the packing plan developed by the Regional Planning Committee as it provided a greater number of channels in the metropolitan areas located within Region 24. The committee decided to vote on the plan they preferred to use in the Region 24 Plan, and voted (unanimously) to implement the Region 24 packing plan and the number of channels indicated on the internally developed plan. The members in attendance also voted in favor of including technical material, in accordance with NCC guidelines, in the final version of the Plan so applicants could review the Region's expectations with regard to expected service area coverage, system contours etc. It was decided at the January 10, 2003 meeting that the Region, under the direction of the Chairperson, should file the Region 24 700 MHz plan with the FCC under Docket 02-378, per the FCC's Public Notice DA 02-3497 dated 12-31-2002.
The FCC issued a public notice on this meeting, DA 02-3195 dated November 19, 2002.
The meeting was adjourned

April 22, 2003
Region 24 700 MHz Regional Planning Committee is again represented at the Missouri State Emergency Management Agency Annual Conference at the Lake of the Ozarks April 21-23, 2003. The Regional Chairperson was provided a table in the exhibit area and displayed channel plans, information regarding channel allotments and pamphlets supporting the 700 MHz process in Missouri.

July 1, 2003
Region 24 held a 700 MHz meeting at the State Emergency Management Agency facility in Jefferson City, Missouri on July 1, 2003. Items discussed were:
The approval process for acceptance of the regional plan by the FCC and what was the time frame involved. Chairperson Devine advised the committee on the process of approval, adjacent region concurrence and a time frame to expect before being able to file. The inter-regional dispute resolution form and the purpose for obtaining adjacent state concurrence was discussed and several questions were answered.
Chairperson Devine and Vice Chair Steve Makky discussed the CAPRAD database and its function in assisting regional planning committees in the 700 MHz process. The committee members in attendance had questions regarding the licensing process and channel allotments for their respective county. All information was provided to the satisfaction of the committee.
Chairperson Devine announced that he would make the Committee aware via the rpc24@yahoogroups.com list-serve when the plan has been filed with the FCC.

February 4, 2004
Region 24 Chairperson Steve Devine traveled to Little Rock Arkansas to

attend the initial Region 4 (Arkansas) Regional Planning meeting. He provided information on Missouri's pending plan and how border issues with Region 4, as well as other bordering regions, will be worked out through the use of the CAPRAD channel packing sort. He also provided Region 4 attendees information on Missouri's wideband data sort of indicated that the sort offered a significant number of channels along Missouri's adjacent borders.

March 29, 2004
FCC Wireless Telecommunications Bureau returns Region 24's plan for several reasons and require adjacent region concurrence to be obtained from all eight (8) adjacent states.
April 8, 2004 Region 24 files a Petition for Reconsideration with the Wireless Telecommunications Bureau to reconsider the return of the Region 24 application. The main concern of Region 24 is the requirement of the adjacent region coordination with the six (6) adjacent regions Region24 submitted previously.

October 2004
Region 24 Chairperson Stephen Devine speaks with FCC Wireless Telecommunications Bureau and clarifies what Region 24 needs to accomplish regarding its plan prior to re-filing.

December 8 2004 Region 24 700 MHz meeting held at St Louis City Police Department 1 PM. The 700 MHz regional planning committee meeting was called to order at 1 PM. In the absence of RPC Secretary Steve Makky, Chairperson Steve Devine took meeting minutes. Discussions on the 700 MHz regional plan and the Missouri SIEC's role in the administration of the 700 MHz narrowband interoperability channels took place with the committee voting to support the Chairperson modifying and re-submitting the 700 MHz regional plan to the FCC. Discussions also took place on 4.9 GHz and the Chairperson asked the RPC members in attendance what they felt was the most appropriate was for the RPC to address 4.9 GHz regional planning. The group was brought up to date with the FCC's most recent document accepting both the DSRC "A" mask and the DSRC "C" for 4.9 GHz public safety use. They were also made aware of the FCC's decision to not require regional planning in the administration of 4.9 GHz public safety spectrum and that while the FCC thinks the RPC approach might benefit the implementation across the country, they would not mandate that users adhere to a regional plan.
Chairperson Devine suggested a plan be filed that explained the 4.9 GHz band, its anticipated use and benefits to the Region 24 public safety community, the geographic licenses issued based on jurisdictional boundaries and how those differ from previous licenses and how the RPC would be a "clearinghouse" to the users community and assist those that wanted to implement 4.9 GHz. The RPC is planning on utilizing the CAPRAD

database to document the use within the region, but will need the help of the users to accomplish this.
The RPC members in attendance supported this approach and recommended the Chairperson DRAFT a 4.9 GHz plan that included guidelines for use and explained how the RPC would not develop a plan, but rather assist in the development in the band while documenting its use across Region 24.
Meeting adjourned at 250 PM CST

March 7, 2005
Region 24 re-files 700 MHz plan with FCC WTB

Appendix E
Table of Interoperability Channels

NOTE: The interoperability nomenclature identified below is for reference only pending finalization of channel labeling recommendations currently before the FCC.
These recommendations originated from the National Coordination Committee (NCC) Interoperability Subcommittee asking for standardized channel nomenclature
and labeling. The Federal Communications Commission's decisions on channel labeling can alter these values accordingly. The FCC designated 700 MHz interoperability channels will be administered by the Missouri Statewide Interoperability Executive Committee with Federal Communications Commission rules. The FCC's final ruling on interoperability channel labeling and interoperability
channel designations and the Missouri Statewide Interoperability Executive Committee interpretation of those rules take precedence over any Region 24 recommendation in this plan.

For Specific Uses/Services

16 CHANNEL SETS

DESCRIPTION LABEL

Channel 23 & 24 General Public Safety Services (secondary trunked)
7TAC58
Channel 103 & 104 General Public Safety Services (secondary trunked)
7TAC62
Channel 183 & 184 General Public Safety Services (secondary trunked)
7TAC66
Channel 263 & 264 General Public Safety Services (secondary

trunked)
7TAC70
Channel 39 &40 Calling Channel 7CALL1
Channel 119 & 120 General Public Safety Service 7TAC63
Channel 199 & 200 General Public Safety Service 7TAC67
Channel 279 & 280 Mobile Data 7DAT71
Channel 63 & 64 Emergency Medical Service 7EMS60
Channel 143 & 144 Fire Service 7FIR64
Channel 223 & 224 Law Enforcement Service 7LAW68
Channel 303 & 304 Mobile Repeater 7MOB68
Channel 79 & 80 Emergency Medical Service 7EMS61
Channel 159 & 160 Fire Service 7FIR65
Channel 239 & 240 Law Enforcement Service 7LAW69
Channel 319 & 320 Other Public Service 7TAC73
Channel 657 & 658 General Public Safety Services (secondary trunked)
7TAC74
Channel 737 & 738 General Public Safety Services (secondary trunked)
7TAC78
Channel 817 & 818 General Public Safety Services (secondary trunked)
7TAC82
Channel 897 & 898 General Public Safety Services (secondary trunked)
7TAC86
Channel 681 & 682 Calling Channel 7CALL2
Channel 761 & 762 General Public Safety Service 7TAC79
Channel 841 & 842 General Public Safety Service 7TAC83
Channel 921 & 922 Mobile Data 7DAT87
Channel 641 & 642 Emergency Medical Service 7EMS76
Channel 721 & 742 Fire Service 7FIR80
Channel 801 & 802 Law Enforcement Service 7LAW84
Channel 881 & 882 Mobile Data 7MOB88
Channel 697 & 698 Emergency Medical Service 7EMS77
Channel 777 & 778 Fire Services 7FIR81
Channel 857 & 858 Law Enforcement Service 7LAW85
Channel 937 & 938 Other Public Services 7TAC89
Trunking is permitted on the 10 channel sets indicated in italic

Project 25 Common Air Interface
Interoperability channel parameters
Certain common P25 parameters need to be defined to ensure digital radios operating on the 700 MHz Interoperability Channels can communicate. This is analogous to defining the common CTCSS tone used on NPSPAC analog Interoperability channels.

Network Access Code

In the Project 25 Common Air Interface definition, the Network Access Code is analogous to the use of CTCSS and CDCSS signals in analog radio systems. It is a code transmitted in the pre-amble of the P25 signal and repeated periodically throughout the transmission. Its purpose is to provide selective access to and maintain access to a receiver. It is also used to block nuisance and other co-channel signals. There are up to 4096 of these NAC codes. For ease of migration in other frequency bands, a NAC code table was developed which shows a mapping of CTCSS and CDCSS signals into corresponding NAC codes. Document TIA/EIA TSB102.BAAC contains NAC code table and other Project 25 Common Air Interface Reserve Values.

Use of corresponding NAC code $293 is required for the 700 MHz Interoperability Channel NAC code.

Talk group ID

In the Project 25 Common Air Interface definition, the Talk group ID on conventional channels is analogous to the use of talk groups in trunking. In order to ensure that all users can communicate, all units should use a common Talk group ID.

Recommendation: Use P25 default value for Talk group ID = $0001

Manufacturer's ID

The Project 25 Common Air Interface allows the ability to define manufacturer specific functions. In order to ensure that all users can communicate, all units should not use a specific Manufacturer's ID, but should use the default value of $00.

Message ID

The Project 25 Common Air Interface allows the ability to define specific message functions. In order to ensure that all users can communicate, all units should use the default Message ID for unencrypted messages of $00000000000000000000.

Encryption Algorithm ID and Key ID

The Project 25 Common Air Interface allows the ability to define specific encryption algorithms and encryption keys. In order to ensure that all users can communicate, encryption should not be used on the Interoperability Calling Channels, all units should use the default Algorithm ID for unencrypted messages of $80 and default Key ID for unencrypted messages 0000.

These same defaults may be used for the other Interoperability channels when encryption is not used.

Use of encryption is allowed on the other Interoperability channels. Regional Planning Committees need to define appropriate Message ID, Encryption Algorithm ID, and Encryption Key ID to be used in the encrypted mode on Interoperability channels.

Appendix F
NCC 700 MHz Pre-Assignment Rules/Recommendations

Introduction

A process for doing the initial block assignments of 700 MHz channels before details of actual system deployments is required. In this initial phase, there is little actual knowledge of what specific equipment is to be deployed and where the sites will be. As a result, a high level simplified
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.

Overview

Assignments will be based on a defined service area of each applicant. For Public Safety entities this will normally be a geographically defined area such as city, county or by a data file consisting
of line segments creating a polygon that encloses the defined area. TIA/EIA TSB88-A (or latest version) will be used to determine harmful interference assuming 40 dB μ , or greater, signal in all
systems coverage areas.

For co-channel assignments, the 40dB μ 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 low density.

The interfering co-channel 15 dB μ contour will be allowed to touch but not overlap the 40 dB μ
contour of the system being evaluated. All contours are (50,50). TIA/EIA TSB88-A (or latest version) will be used to determine harmful interference assuming 40 dB μ , or greater, signal in all
systems coverage areas.

For adjacent and alternate channels, the interfering channels 60 dB μ will be allowed to touch but
not overlap the 40 dB μ contour of the system being evaluated. All contours are (50,50). TIA/EIA
TSB88-A (or latest version) will be used to determine harmful interference assuming 40 dB μ , or
greater, signal in all systems coverage areas.

7.4.1.1 Discussion

The FCC limits the maximum field strength to 40 dB relative to 1μV/m (customarily denoted as 40
dBμ). It is assumed that this limitation will be applied similarly to the way it is applied in the 821-
824/866/869 MHz band. That is, a 40 dBμ field strength can be deployed up to a defined distance from 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 as the potential for interference from CMRS

infrastructure demands that public safety systems have adequate margins for reliability in the presence of interference. The value of 40 dBμ corresponds to a signal of -92.7 dBm, received by a half-wavelength dipole (λ/2) antenna. The thermal noise floor for a 6.25 kHz 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. Allowing for a 3 dB reduction in the available margin due to CMRS OOBE noise lowers the reliability and/or the channel performance of Public Safety systems. TIA TR8 made this allowance during the meetings in Mesa, AZ, January 2001. In addition, there are various channel bandwidths with different performance criteria and 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. There would be a single co-channel source, but potentially several adjacent or alternate channel sources involved.

Desired Signal Level
C/I, 1%
Multiple Sources
Multiple bandwidths
Receiver kTb + NF (dB)
-126 dBm (6.25 kHz)
CMRS Site Noise)
C/N
Determines
performance &
reliability
C/N - 3 dB
Joint Probability
Determines
ultimate
performance &
reliability

Figure 1 - Interfering Sources Create A "Noise" Level Influencing Reliability

It is recommended that co-channel assignments limit the C/I at the edge (worst case mile) be sufficient to limit that interference to <1%. A C/I ratio of 26.4 dB plus the required capture value required to achieve this goal.. A 17 - 20 dB C/N is required to achieve channel performance. Table 1 shows estimated performance considering the 3 dB noise floor rise at the 40 dBμ signal level.

Performance varies due to the different Cf/N requirements of the different modulations and channel
bandwidths. These values are appropriate for a mobile on the street, but are considerably short to provide reliable communications to portables inside buildings.

Channel Bandwidth	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)	**13.52**	**13.52**	**10.76**	**5.75**
Standard deviation (8 dB)	8.0	8.0	8.0	8.0
Z	1.690	1.690	1.345	0.718
Noise Reliability (%)	**95.45%**	**95.45%**	**91.06%**	**76.37%**
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)	**94.2%**	**94.2%**	**90.4%**	**75.8%**

40 dBu = -92.7 dBm @ 770 MHz

Comparison of Joint Reliability for various configurations

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

To analyze the impact of requiring portable in building coverage, several scenarios are presented. The different scenarios involve a given separation from the desired sites. Then the impact of simulcast is included to show that the 40 dBμ must be able to fall outside the edge of the service area. From the analysis, recommendations of how far the 40 dBμ extensions should be allowed to occur are made.

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 OOBE is suppressed to TIA's most recent recommendation and the "site isolation" is maintained at 65 dB minimum.

• The 40 dBμ 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
(%)
85.60% 85.60% 76.58% 39.17%
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 2, Estimated Performance From Site(s) 2.5 Miles From Typical Urban Buildings.
Table 2 shows for the example case of 2.5 miles that simulcast is required to achieve public safety
levels of reliability. The difference in performance margin requirements would require more sites and closer site-to-site separation for wider bandwidth channels.
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. - 5.0 dB
23.75 dBW ≈ 240 Watts (ERPd)
Jurisdiction
5 miles wide
30.1 dBμ
21.6 dBμ
23.6 dBμ
40.1 dBμ
41.6 dBμ
43.3 dBμ
-72.7 dBm
60.1 dBμ
Figure 2 - Field Strength From Left Most Site.
Figure 3 - Antenna Configuration Required To Limit Field Strength Off "Backside"
Figure 2 is for an urbanized area with a jurisdiction of 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 utilizing direction 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 composite field strength of approximately 40 dBμ. 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 backscatter 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 field strength 5 miles beyond in excess of 44 dBμ. 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.
The down tilting of antennas to control the 40 dBμ is not practical as the difference in angular discrimination from a 200-foot tall tower at 2.5 miles and 10 miles is approximately 0.6 degrees.
Tables 3 and 4 represent the same configuration, but for less dense buildings. In these cases, the distance to extend the 40 dBm can be determined from Table Z. Recommendations are made in Table 6.

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)	-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 (%)	**85.60%**	**85.60%**	**76.58%**	**39.17%**
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%

Estimated Performance at 3.5 miles from each site
Table 3 - Lower Loss Buildings, 3.5 Mile From Site(s)

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)	-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 (%)	**85.60%**	**85.60%**	**76.58%**	**39.17%**
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%

Estimated Performance at 5.0 miles from each site
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.

Overshoot Distance (mi)	Field Strength (dBμ)	20 dB F/B (dBμ)
1	73.3	53.3
2	63.3	43.3
2.5	60.1	40.1
3	57.5	37.5
4	53.3	33.5
5	50.1	30.1
…	…	
10	40.1	
11	38.4	
12	37.5	
13	36.0	
14	34.5	
15	33.0	

Table 5 - Field Strength Vs. Distance From Site
This allows the overshoot to be 11 miles so the extension of the 40 dbm can be 4 miles for suburbanized territory. For the more rural territory, the limit is the signal strength off the back of the antenna. So the result is that for various types of urbanized areas the offset of the 40 dbm should be:

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 Dbμ Field Strength
The 40 dBμ can then be constructed based on the defined service area without having to perform an
actual prediction. Since the 40 dBμ is beyond the edge of the service area, some relaxation in the level of I is reasonable. Therefore a 35 dB ration is recommended and is consistent with what is currently being licensed in the 821-824/866-869 MHz Public Safety band.

Co-Channel Recommendation
• Allow the constructed 40 dBμ (50,50) to extend beyond the edge of the defined service area by the distance indicated in Table 6.
• Allow the Interfering 15 dBμ (50,50) to intercept but not overlap the 40 dBμ 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 OOBE.

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. ACP defines the energy in a measured bandwidth that is typically wider than the receiver. As a result, the FCC values are optimistic at very close spacing and somewhat pessimistic at wider spacing, as the typical receiver filter is less than the channel bandwidth.

Site
Separation
5 dBu(50,50)
Interference Contour
Service Area
40 dBu (50,50)
Service Area + 3/5 miles
700 MHz Co- Channel Reuse

In addition, as a channel bandwidth is increased, the total noise is allowed to rise, as it is initially defined in a 6.25 kHz channel bandwidth. However, the effect is diminished at very close spacing
as the noise is rapidly falling off. At greater spacing, the noise is essentially flat and the receiver’s
filter limits the noise to the specified 3 dB rise in the thermal noise floor.

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 receiver muting. Therefore at least 17 dB plus the margin for keeping the interference below 1% probability requires
a total margin of 43.4 dB. However, this margin would be at the edge of the service area and the 40

dBμ 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.
Project 25 requires that a transceiver receiver have an ACIPR of 60 dB. This implies that an ACCPR ≥ 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.
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 ≥ 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 block.
Figure 5, Potential Frequency Separations
Base initial (presorts) on 25 kHz 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.
Case ACCPR
25 kHz 65 dB
18.725 kHz 65 dB
15.625 kHz >40 dB
12.5 kHz 65 dB
9.375 kHz >40 dB
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 Phase 2 narrowband 6.25 kHz channel. If system designers keep this
consideration in mind and move the edge 6.25 kHz channels inward on their own systems, then a constant
value of 65 dB ACCPR can be applied across all 25 kHz channels regardless of what is eventually deployed.
For other blocks, it must be assumed that transmitter filtering in addition to transmitter performance
improvements with greater frequency separation will further reduce the ACCPR.
Therefore it is recommended that a consistent value of 65 dB ACCPR be used for coordinating adjacent 25
kHz channel blocks. Rounding to be conservative due to the possibility of multiple sources allows the "I"
contour to be approximately 20 dB above the 40 dBμ contour, 60 dBμ.

A B
1 2 3 4 1 2 3 4
25.0
12.5
9.375
6.25
15.625
18.725
Desired Signal [C]
40 dBμ
Interfering Signal [I]
Requirement for <1%
26.4 + 17 = 43.4 dB
Allowable I
40 dBμ - 43.4 + 65 ≈ **60 dB**μ
ACCPR = 65 dB
Figure 6 - Adjusted Adjacent 25 kHz Channel Interfering Contour Value
An adjacent Interfering (25 kHz) channel shall be allowed to have its 60 dBμ (50,50) contour touch
but not overlap the 40 dBμ (50,50) contour of a system being evaluated. Evaluations should be made in both directions.
Figure 7 - Example Of Adjacent/Alternate Overlap Criterion
65 dB ACCPR, Based on P25 Requirements of 60 dB ACIPR
Site Separation (D)
60 dBμ= 0.23 D
38.5 Log(0.77/0.23)≈ 20 dB
C/I = -20 dB
40 dBμ= 0.77 D
This simple method is only adequate for presorting large blocks 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 ERP's and HAAT's
• 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.

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, a 10% Interference is specified; the C/I implies 90% probability of successfully achieving the desired
ratio. At 1% interference, means that there is a 99% probability of achieving the desired C/I.

$$\frac{C}{I}\% = \bullet\ erfc\left(\frac{1}{2}\frac{C}{I}_{margin}\right) \quad (1)$$

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, $Z = 1.28$.

$$\frac{C}{I}\% = Z \cdot 2 \cdot \sigma \quad (2)$$

The most common requirements for several typical lognormal standard deviations (σ) 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 26.36 dB 32.95 dB
Table A1 - Probability Of Not Achieving C/I For Various Location Lognormal Standard Deviations
Probability of Achieving Required C/I verses Mean C/I as a Funcation of Location Lognormal Standard deviation (does not include C/N requirement)
0.1
1
10
100
0 5 10 15 20 25 30 35 40
C/I (dB)
Interference Probability (%)
10
8
6.5
5.6
5
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 values 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. This provides the additional flexibility necessary to complete the 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 is a less
degradation of the 90%

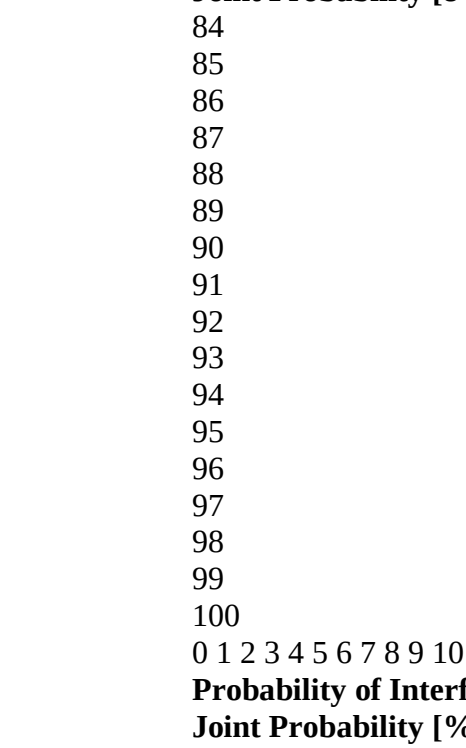

Figure A2 - Effect Of Joint Probability On The Composite Probability

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.

Appendix G

The Region 24 Channel allocations have been established by the National Public Safety

Telecommunications Council's channel packing program. Region 24 anticipates an open filing window where applicants can apply for available channels in their county area, until all channels are depleted. 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 24 to maximize channel re-use of any "orphan" remainders.

12/16/2007 Region 24
Channel Allotments

General Use

County	Band	FCC Channel Number	Base New Frequency	Mobile New Base
Adair	Voice 25KHz	17-20	769.1125	799.1125
	Voice 25KHz	57-60	769.3625	799.3625
	Voice 25KHz	125-128	769.7875	799.7875
	Voice 25KHz	177-180	770.1125	800.1125
	Voice 25KHz	281-284	770.7625	800.7625
	Voice 25KHz	329-332	771.0625	801.0625
	Voice 25KHz	385-388	771.4125	801.4125
	Voice 25KHz	437-440	771.7375	801.7375
	Voice 25KHz	477-480	771.9875	801.9875
	Voice 25KHz	501-504	772.1375	802.1375
	Voice 25KHz	577-580	772.6125	802.6125
	Voice 25KHz	617-620	772.8625	802.8625
	Voice 25KHz	709-712	773.4375	803.4375
	Voice 25KHz	793-796	773.9625	803.9625
	Voice 25KHz	861-864	774.3875	804.3875
	Voice 25KHz	913-916	774.7125	804.7125
Andrew	Voice 25KHz	93-96	769.5875	799.5875
	Voice 25KHz	173-176	770.0875	800.0875
	Voice 25KHz	281-284	770.7625	800.7625
	Voice 25KHz	353-356	771.2125	801.2125
	Voice 25KHz	397-400	771.4875	801.4875
	Voice 25KHz	437-440	771.7375	801.7375
	Voice 25KHz	597-600	772.7375	802.7375
	Voice 25KHz	673-676	773.2125	803.2125
	Voice 25KHz	797-800	773.9875	803.9875
	Voice 25KHz	861-864	774.3875	804.3875
	Voice 25KHz	945-948	774.9125	804.9125
Atchison	Voice 25KHz	341-344	771.1375	801.1375
	Voice 25KHz	385-388	771.4125	801.4125
	Voice 25KHz	509-512	772.1875	802.1875
	Voice 25KHz	589-592	772.6875	802.6875
	Voice 25KHz	717-720	773.4875	803.4875
	Voice 25KHz	825-828	774.1625	804.1625

Audrain Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 245-248 770.5375 800.5375
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 617-620 772.8625 802.8625
Voice 25KHz 705-708 773.4125 803.4125
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 901-904 774.6375 804.6375
Barry Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 537-540 772.3625 802.3625
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 901-904 774.6375 804.6375
Voice 25KHz 941-944 774.8875 804.8875
Barton Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 569-572 772.5625 802.5625 Campus
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 705-708 773.4125 803.4125 Campus
Voice 25KHz 789-792 773.9375 803.9375
Bates Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 325-328 771.0375 801.0375 Campus
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 377-380 771.3625 801.3625 Campus
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 465-468 771.9125 801.9125 Campus
Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 521-524 772.2625 802.2625 Campus
Voice 25KHz 633-636 772.9625 802.9625 Campus
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 717-720 773.4875 803.4875 Campus
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 821-824 774.1375 804.1375 Campus
Voice 25KHz 833-836 774.2125 804.2125 Campus
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 909-912 774.6875 804.6875
Benton Voice 25KHz 81-84 769.5125 799.5125

Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 341-344 771.1375 801.1375
Voice 25KHz 345-348 771.1625 801.1625 Campus
Voice 25KHz 369-372 771.3125 801.3125 Campus
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 425-428 771.6625 801.6625
Voice 25KHz 477-480 771.9875 801.9875 Campus
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 501-504 772.1375 802.1375 Campus
Voice 25KHz 541-544 772.3875 802.3875 Campus
Voice 25KHz 565-568 772.5375 802.5375 Campus
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 785-788 773.9125 803.9125 Campus
Bollinger Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 829-832 774.1875 804.1875
Boone Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 349-352 771.1875 801.1875
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 437-440 771.7375 801.7375
Voice 25KHz 477-480 771.9875 801.9875
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 713-716 773.4625 803.4625
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 833-836 774.2125 804.2125
Voice 25KHz 873-876 774.4625 804.4625
Voice 25KHz 913-916 774.7125 804.7125
Buchanan Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 253-256 770.5875 800.5875
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 473-476 771.9625 801.9625

Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 537-540 772.3625 802.3625
Voice 25KHz 577-580 772.6125 802.6125
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 913-916 774.7125 804.7125
Butler Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 713-716 773.4625 803.4625
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 833-836 774.2125 804.2125
Voice 25KHz 905-908 774.6625 804.6625
Caldwell Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 349-352 771.1875 801.1875 Campus
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 557-560 772.4875 802.4875 Campus
Voice 25KHz 613-616 772.8375 802.8375 Campus
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 909-912 774.6875 804.6875
Voice 25KHz 941-944 774.8875 804.8875 Campus
Callaway Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 521-524 772.2625 802.2625
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 793-796 773.9625 803.9625
Camden Voice 25KHz 13-16 769.0875 799.0875

Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 861-864 774.3875 804.3875
Voice 25KHz 909-912 774.6875 804.6875
Cape
Girardeau Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 253-256 770.5875 800.5875
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 917-920 774.7375 804.7375
Carroll Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 213-216 770.3375 800.3375
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 521-524 772.2625 802.2625
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 713-716 773.4625 803.4625
Voice 25KHz 869-872 774.4375 804.4375
Carter Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 705-708 773.4125 803.4125

Voice 25KHz 873-876 774.4625 804.4625
Cass Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 245-248 770.5375 800.5375
Voice 25KHz 349-352 771.1875 801.1875
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 393-396 771.4625 801.4625 Campus
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 553-556 772.4625 802.4625 Campus
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 597-600 772.7375 802.7375 Campus
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 861-864 774.3875 804.3875 Campus
Cedar Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 917-920 774.7375 804.7375
Chariton Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 905-908 774.6625 804.6625
Christian Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 385-388 771.4125 801.4125
Voice 25KHz 425-428 771.6625 801.6625
Voice 25KHz 493-496 772.0875 802.0875
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 593-596 772.7125 802.7125
Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 837-840 774.2375 804.2375
Voice 25KHz 877-880 774.4875 804.4875
Clark Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 585-588 772.6625 802.6625

Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 745-748 773.6625 803.6625
Clay Voice 25KHz 129-132 769.8125 799.8125 Campus
Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 593-596 772.7125 802.7125 Campus
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 665-668 773.1625 803.1625
Clinton Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 709-712 773.4375 803.4375
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 901-904 774.6375 804.6375
Cole Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 493-496 772.0875 802.0875
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 825-828 774.1625 804.1625
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 905-908 774.6625 804.6625
Voice 25KHz 945-948 774.9125 804.9125
Cooper Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 589-592 772.6875 802.6875

Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 749-752 773.6875 803.6875
Crawford Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 385-388 771.4125 801.4125
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 909-912 774.6875 804.6875
Dade Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 525-528 772.2875 802.2875 Campus
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 613-616 772.8375 802.8375 Campus
Voice 25KHz 709-712 773.4375 803.4375 Campus
Dallas Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 833-836 774.2125 804.2125
Daviess Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 341-344 771.1375 801.1375
Voice 25KHz 385-388 771.4125 801.4125
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 617-620 772.8625 802.8625
Voice 25KHz 741-744 773.6375 803.6375
De Kalb Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 837-840 774.2375 804.2375

Voice 25KHz 877-880 774.4875 804.4875
Dent Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 341-344 771.1375 801.1375 Campus
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 481-484 772.0125 802.0125 Campus
Voice 25KHz 525-528 772.2875 802.2875 Campus
Voice 25KHz 573-576 772.5875 802.5875 Campus
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 749-752 773.6875 803.6875 Campus
Voice 25KHz 753-756 773.7125 803.7125 Campus
Voice 25KHz 825-828 774.1625 804.1625 Campus
Voice 25KHz 833-836 774.2125 804.2125
Voice 25KHz 913-916 774.7125 804.7125 Campus
Voice 25KHz 945-948 774.9125 804.9125
Douglas Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 829-832 774.1875 804.1875
Dunklin Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 593-596 772.7125 802.7125
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 797-800 773.9875 803.9875
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 913-916 774.7125 804.7125
Franklin Voice 25KHz 129-132 769.8125 799.8125
Voice 25KHz 349-352 771.1875 801.1875
Voice 25KHz 397-400 771.4875 801.4875
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 577-580 772.6125 802.6125
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 669-672 773.1875 803.1875
Voice 25KHz 837-840 774.2375 804.2375
Gasconade Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 357-360 771.2375 801.2375

Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 941-944 774.8875 804.8875
Gentry Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 477-480 771.9875 801.9875
Voice 25KHz 493-496 772.0875 802.0875
Voice 25KHz 561-564 772.5125 802.5125 Campus
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 829-832 774.1875 804.1875
Voice 25KHz 905-908 774.6625 804.6625
Greene Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 477-480 771.9875 801.9875
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 705-708 773.4125 803.4125
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 825-828 774.1625 804.1625
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 905-908 774.6625 804.6625
Voice 25KHz 945-948 774.9125 804.9125
Grundy Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 669-672 773.1875 803.1875
Voice 25KHz 797-800 773.9875 803.9875
Harrison Voice 25KHz 57-60 769.3625 799.3625

Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 425-428 771.6625 801.6625
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 873-876 774.4625 804.4625
Henry Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 829-832 774.1875 804.1875
Voice 25KHz 941-944 774.8875 804.8875
Hickory Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 505-508 772.1625 802.1625
Voice 25KHz 557-560 772.4875 802.4875
Voice 25KHz 617-620 772.8625 802.8625
Holt Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 629-632 772.9375 802.9375
Howard Voice 25KHz 129-132 769.8125 799.8125
Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 757-760 773.7375 803.7375
Howell Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 505-508 772.1625 802.1625

Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 905-908 774.6625 804.6625
Iron Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 557-560 772.4875 802.4875 Campus
Voice 25KHz 625-628 772.9125 802.9125 Campus
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 877-880 774.4875 804.4875 Campus
Voice 25KHz 905-908 774.6625 804.6625 Campus
Voice 25KHz 917-920 774.7375 804.7375 Campus
Jackson Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 469-472 771.9375 801.9375
Voice 12.5KHz 501-502 772.1313 802.1313
Voice 12.5KHz 503-504 772.1438 802.1438
Voice 25KHz 549-552 772.4375 802.4375
Voice 12.5KHz 589-590 772.6813 802.6813
Voice 12.5KHz 591-592 772.6938 802.6938
Voice 25KHz 629-632 772.9375 802.9375
Voice 12.5KHz 705-706 773.4063 803.4063
Voice 12.5KHz 707-708 773.4188 803.4188
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 785-788 773.9125 803.9125
Voice 12.5KHz 825-826 774.1563 804.1563
Voice 12.5KHz 827-828 774.1688 804.1688
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 905-908 774.6625 804.6625
Voice 12.5KHz 945-946 774.9063 804.9063
Voice 12.5KHz 947-948 774.9188 804.9188
Jasper Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 89-92 769.5625 799.5625

Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 341-344 771.1375 801.1375
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 505-508 772.1625 802.1625
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 833-836 774.2125 804.2125
Voice 25KHz 873-876 774.4625 804.4625
Voice 25KHz 913-916 774.7125 804.7125
Jefferson Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 341-344 771.1375 801.1375
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 437-440 771.7375 801.7375
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 593-596 772.7125 802.7125
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 709-712 773.4375 803.4375
Voice 25KHz 825-828 774.1625 804.1625
Voice 25KHz 873-876 774.4625 804.4625
Voice 25KHz 913-916 774.7125 804.7125
Johnson Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 577-580 772.6125 802.6125
Voice 25KHz 669-672 773.1875 803.1875
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 793-796 773.9625 803.9625
Voice 25KHz 873-876 774.4625 804.4625
Knox Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 673-676 773.2125 803.2125

Laclede Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 577-580 772.6125 802.6125
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 901-904 774.6375 804.6375
Voice 25KHz 941-944 774.8875 804.8875
Lafayette Voice 25KHz 13-16 769.0875 799.0875 Campus
Voice 25KHz 53-56 769.3375 799.3375 Campus
Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 121-124 769.7625 799.7625 Campus
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 373-376 771.3375 801.3375
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 537-540 772.3625 802.3625
Voice 25KHz 581-584 772.6375 802.6375 Campus
Voice 25KHz 617-620 772.8625 802.8625
Voice 25KHz 913-916 774.7125 804.7125
Lawrence Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 253-256 770.5875 800.5875
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 613-616 772.8375 802.8375
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 717-720 773.4875 803.4875
Lewis Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 873-876 774.4625 804.4625
Voice 25KHz 917-920 774.7375 804.7375
Lincoln Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 253-256 770.5875 800.5875
Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 473-476 771.9625 801.9625

Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 909-912 774.6875 804.6875
Linn Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 945-948 774.9125 804.9125
Livingston Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 917-920 774.7375 804.7375
Macon Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 593-596 772.7125 802.7125
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 825-828 774.1625 804.1625
Voice 25KHz 877-880 774.4875 804.4875
Madison Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 505-508 772.1625 802.1625
Voice 25KHz 573-576 772.5875 802.5875

Voice 25KHz 617-620 772.8625 802.8625
Voice 25KHz 865-868 774.4125 804.4125
Maries Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 473-476 771.9625 801.9625 Campus
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 513-516 772.2125 802.2125 Campus
Voice 25KHz 533-536 772.3375 802.3375
Voice 25KHz 617-620 772.8625 802.8625 Campus
Voice 25KHz 829-832 774.1875 804.1875 Campus
Marion Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 905-908 774.6625 804.6625
McDonald Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 397-400 771.4875 801.4875
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 829-832 774.1875 804.1875
Mercer Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 405-408 771.5375 801.5375
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 865-868 774.4125 804.4125
Miller Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 373-376 771.3375 801.3375
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 797-800 773.9875 803.9875

Mississippi Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 533-536 772.3375 802.3375
Voice 25KHz 625-628 772.9125 802.9125
Voice 25KHz 793-796 773.9625 803.9625
Moniteau Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 613-616 772.8375 802.8375
Monroe Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 213-216 770.3375 800.3375
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 505-508 772.1625 802.1625
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 669-672 773.1875 803.1875
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 865-868 774.4125 804.4125
Montgomery Voice 25KHz 341-344 771.1375 801.1375
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 861-864 774.3875 804.3875
Voice 25KHz 917-920 774.7375 804.7375
Morgan Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 717-720 773.4875 803.4875
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 917-920 774.7375 804.7375
New Madrid Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 581-584 772.6375 802.6375
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 701-704 773.3875 803.3875

Newton Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 129-132 769.8125 799.8125

Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 557-560 772.4875 802.4875
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 797-800 773.9875 803.9875
Voice 25KHz 861-864 774.3875 804.3875
Nodaway Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 205-208 770.2875 800.2875
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 661-664 773.1375 803.1375
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 917-920 774.7375 804.7375
Oregon Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 557-560 772.4875 802.4875
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 861-864 774.3875 804.3875
Osage Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 709-712 773.4375 803.4375
Voice 25KHz 781-784 773.8875 803.8875
Ozark Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 561-564 772.5125 802.5125

Voice 25KHz 609-612 772.8125 802.8125
Pemiscot Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 757-760 773.7375 803.7375
Perry Voice 25KHz 345-348 771.1625 801.1625
Voice 25KHz 441-444 771.7625 801.7625
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 705-708 773.4125 803.4125
Voice 25KHz 793-796 773.9625 803.9625
Voice 25KHz 945-948 774.9125 804.9125
Pettis Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 709-712 773.4375 803.4375
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 837-840 774.2375 804.2375
Voice 25KHz 901-904 774.6375 804.6375
Phelps Voice 25KHz 41-44 769.2625 799.2625
Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 213-216 770.3375 800.3375
Voice 25KHz 253-256 770.5875 800.5875
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 705-708 773.4125 803.4125
Voice 25KHz 793-796 773.9625 803.9625
Pike Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 373-376 771.3375 801.3375
Voice 25KHz 441-444 771.7625 801.7625

Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 665-668 773.1625 803.1625
Platte Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 717-720 773.4875 803.4875
Polk Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 213-216 770.3375 800.3375
Voice 25KHz 349-352 771.1875 801.1875
Voice 25KHz 397-400 771.4875 801.4875
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 533-536 772.3375 802.3375
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 713-716 773.4625 803.4625
Pulaski Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 137-140 769.8625 799.8625
Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 477-480 771.9875 801.9875
Voice 25KHz 501-504 772.1375 802.1375
Voice 25KHz 593-596 772.7125 802.7125
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 713-716 773.4625 803.4625
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 837-840 774.2375 804.2375
Voice 25KHz 877-880 774.4875 804.4875
Putnam Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 397-400 771.4875 801.4875
Voice 25KHz 461-464 771.8875 801.8875
Voice 25KHz 565-568 772.5375 802.5375

Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 821-824 774.1375 804.1375
Ralls Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 385-388 771.4125 801.4125
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 757-760 773.7375 803.7375
Randolph Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 397-400 771.4875 801.4875
Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 557-560 772.4875 802.4875
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 797-800 773.9875 803.9875
Voice 25KHz 941-944 774.8875 804.8875
Ray Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 505-508 772.1625 802.1625 Campus
Voice 25KHz 529-532 772.3125 802.3125
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 833-836 774.2125 804.2125
Reynolds Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 57-60 769.3625 799.3625
Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 521-524 772.2625 802.2625
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 613-616 772.8375 802.8375
Voice 25KHz 781-784 773.8875 803.8875
Ripley Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 573-576 772.5875 802.5875
Voice 25KHz 621-624 772.8875 802.8875
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 825-828 774.1625 804.1625
Saline Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 253-256 770.5875 800.5875

Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 385-388 771.4125 801.4125
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 493-496 772.0875 802.0875
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 633-636 772.9625 802.9625
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 861-864 774.3875 804.3875
Schuyler Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 781-784 773.8875 803.8875
Scotland Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 829-832 774.1875 804.1875
Voice 25KHz 941-944 774.8875 804.8875
Scott Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 129-132 769.8125 799.8125
Voice 25KHz 245-248 770.5375 800.5375
Voice 25KHz 285-288 770.7875 800.7875
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 509-512 772.1875 802.1875
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 861-864 774.3875 804.3875
Voice 25KHz 909-912 774.6875 804.6875
Shannon Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 357-360 771.2375 801.2375
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 489-492 772.0625 802.0625
Voice 25KHz 537-540 772.3625 802.3625
Voice 25KHz 597-600 772.7375 802.7375
Voice 25KHz 637-640 772.9875 802.9875
Shelby Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 493-496 772.0875 802.0875
Voice 25KHz 537-540 772.3625 802.3625
Voice 25KHz 573-576 772.5875 802.5875 Campus
Voice 25KHz 621-624 772.8875 802.8875

Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 837-840 774.2375 804.2375
Voice 25KHz 869-872 774.4375 804.4375 Campus
St. Charles Voice 25KHz 45-48 769.2875 799.2875
Voice 25KHz 121-124 769.7625 799.7625
Voice 25KHz 161-164 770.0125 800.0125
Voice 25KHz 165-168 770.0375 800.0375 Campus
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 281-284 770.7625 800.7625
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 381-384 771.3875 801.3875 Campus
Voice 25KHz 417-420 771.6125 801.6125
Voice 25KHz 505-508 772.1625 802.1625
Voice 25KHz 521-524 772.2625 802.2625 Campus
Voice 25KHz 557-560 772.4875 802.4875 Campus
Voice 25KHz 569-572 772.5625 802.5625
Voice 25KHz 573-576 772.5875 802.5875 Campus
Voice 25KHz 629-632 772.9375 802.9375
Voice 25KHz 713-716 773.4625 803.4625
Voice 25KHz 753-756 773.7125 803.7125 Campus
Voice 25KHz 757-760 773.7375 803.7375
Voice 25KHz 829-832 774.1875 804.1875
St. Clair Voice 25KHz 97-100 769.6125 799.6125 Campus
Voice 25KHz 129-132 769.8125 799.8125
Voice 25KHz 289-292 770.8125 800.8125 Campus
Voice 25KHz 373-376 771.3375 801.3375
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 437-440 771.7375 801.7375 Campus
Voice 25KHz 485-488 772.0375 802.0375 Campus
Voice 25KHz 493-496 772.0875 802.0875 Campus
Voice 25KHz 517-520 772.2375 802.2375 Campus
Voice 25KHz 537-540 772.3625 802.3625 Campus
Voice 25KHz 545-548 772.4125 802.4125
Voice 25KHz 573-576 772.5875 802.5875 Campus
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 673-676 773.2125 803.2125 Campus
Voice 25KHz 757-760 773.7375 803.7375 Campus
Voice 25KHz 877-880 774.4875 804.4875
St. Francois Voice 25KHz 49-52 769.3125 799.3125
Voice 25KHz 97-100 769.6125 799.6125
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 245-248 770.5375 800.5375
Voice 25KHz 293-296 770.8375 800.8375
Voice 25KHz 333-336 771.0875 801.0875
Voice 25KHz 405-408 771.5375 801.5375

Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 533-536 772.3375 802.3375
Voice 25KHz 585-588 772.6625 802.6625
Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 753-756 773.7125 803.7125
Voice 25KHz 901-904 774.6375 804.6375
St. Louis
(City) Voice 25KHz 17-20 769.1125 799.1125 Campus
Voice 25KHz 89-92 769.5625 799.5625 Campus
Voice 25KHz 205-208 770.2875 800.2875 Campus
Voice 25KHz 353-356 771.2125 801.2125
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 553-556 772.4625 802.4625
Voice 25KHz 617-620 772.8625 802.8625
Voice 25KHz 665-668 773.1625 803.1625
Voice 25KHz 705-708 773.4125 803.4125
Voice 25KHz 797-800 773.9875 803.9875
Voice 25KHz 877-880 774.4875 804.4875
St. Louis
County Voice 25KHz 13-16 769.0875 799.0875
Voice 25KHz 53-56 769.3375 799.3375
Voice 25KHz 93-96 769.5875 799.5875
Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 369-372 771.3125 801.3125
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 477-480 771.9875 801.9875
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 541-544 772.3875 802.3875
Voice 25KHz 545-548 772.4125 802.4125 Campus
Voice 25KHz 609-612 772.8125 802.8125
Voice 25KHz 677-680 773.2375 803.2375
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 789-792 773.9375 803.9375
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 905-908 774.6625 804.6625
Voice 25KHz 945-948 774.9125 804.9125
Ste.
Genevieve Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 365-368 771.2875 801.2875

Voice 25KHz 413-416 771.5875 801.5875
Voice 25KHz 465-468 771.9125 801.9125
Voice 25KHz 525-528 772.2875 802.2875
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 785-788 773.9125 803.9125
Stoddard Voice 25KHz 89-92 769.5625 799.5625
Voice 25KHz 297-300 770.8625 800.8625
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 673-676 773.2125 803.2125
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 877-880 774.4875 804.4875
Voice 25KHz 941-944 774.8875 804.8875
Stone Voice 25KHz 85-88 769.5375 799.5375
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 401-404 771.5125 801.5125
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 521-524 772.2625 802.2625
Voice 25KHz 601-604 772.7625 802.7625
Voice 25KHz 793-796 773.9625 803.9625
Voice 25KHz 869-872 774.4375 804.4375
Voice 25KHz 909-912 774.6875 804.6875
Sullivan Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 421-424 771.6375 801.6375
Voice 25KHz 469-472 771.9375 801.9375
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 785-788 773.9125 803.9125
Voice 25KHz 833-836 774.2125 804.2125
Voice 25KHz 901-904 774.6375 804.6375
Taney Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 165-168 770.0375 800.0375
Voice 25KHz 249-252 770.5625 800.5625
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 433-436 771.7125 801.7125
Voice 25KHz 485-488 772.0375 802.0375
Voice 25KHz 637-640 772.9875 802.9875
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 741-744 773.6375 803.6375
Voice 25KHz 781-784 773.8875 803.8875
Voice 25KHz 821-824 774.1375 804.1375
Voice 25KHz 861-864 774.3875 804.3875

Texas Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 129-132 769.8125 799.8125
Voice 25KHz 201-204 770.2625 800.2625
Voice 25KHz 245-248 770.5375 800.5375
Voice 25KHz 321-324 771.0125 801.0125
Voice 25KHz 393-396 771.4625 801.4625
Voice 25KHz 445-448 771.7875 801.7875
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 865-868 774.4125 804.4125
Voice 25KHz 917-920 774.7375 804.7375
Vernon Voice 25KHz 169-172 770.0625 800.0625
Voice 25KHz 209-212 770.3125 800.3125
Voice 25KHz 361-364 771.2625 801.2625
Voice 25KHz 409-412 771.5625 801.5625
Voice 25KHz 449-452 771.8125 801.8125
Voice 25KHz 481-484 772.0125 802.0125
Voice 25KHz 521-524 772.2625 802.2625
Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 837-840 774.2375 804.2375
Voice 25KHz 901-904 774.6375 804.6375
Warren Voice 25KHz 81-84 769.5125 799.5125
Voice 25KHz 177-180 770.1125 800.1125
Voice 25KHz 217-220 770.3625 800.3625
Voice 25KHz 325-328 771.0375 801.0375
Voice 25KHz 365-368 771.2875 801.2875
Voice 25KHz 429-432 771.6875 801.6875
Voice 25KHz 517-520 772.2375 802.2375
Voice 25KHz 613-616 772.8375 802.8375
Washington Voice 25KHz 17-20 769.1125 799.1125
Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 373-376 771.3375 801.3375
Voice 25KHz 425-428 771.6625 801.6625
Voice 25KHz 473-476 771.9625 801.9625
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 561-564 772.5125 802.5125
Voice 25KHz 701-704 773.3875 803.3875
Voice 25KHz 745-748 773.6625 803.6625
Voice 25KHz 797-800 773.9875 803.9875
Wayne Voice 25KHz 125-128 769.7875 799.7875
Voice 25KHz 241-244 770.5125 800.5125
Voice 25KHz 329-332 771.0625 801.0625
Voice 25KHz 381-384 771.3875 801.3875
Voice 25KHz 457-460 771.8625 801.8625
Voice 25KHz 493-496 772.0875 802.0875

Voice 25KHz 589-592 772.6875 802.6875
Voice 25KHz 661-664 773.1375 803.1375
Webster Voice 25KHz 133-136 769.8375 799.8375
Voice 25KHz 173-176 770.0875 800.0875
Voice 25KHz 257-260 770.6125 800.6125
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 377-380 771.3625 801.3625
Voice 25KHz 437-440 771.7375 801.7375
Voice 25KHz 513-516 772.2125 802.2125
Voice 25KHz 565-568 772.5375 802.5375
Voice 25KHz 605-608 772.7875 802.7875
Voice 25KHz 797-800 773.9875 803.9875
Voice 25KHz 913-916 774.7125 804.7125
Worth Voice 25KHz 213-216 770.3375 800.3375
Voice 25KHz 289-292 770.8125 800.8125
Voice 25KHz 337-340 771.1125 801.1125
Voice 25KHz 389-392 771.4375 801.4375
Voice 25KHz 549-552 772.4375 802.4375
Voice 25KHz 677-680 773.2375 803.2375
Wright Voice 25KHz 453-456 771.8375 801.8375
Voice 25KHz 497-500 772.1125 802.1125
Voice 25KHz 557-560 772.4875 802.4875
Voice 25KHz 613-616 772.8375 802.8375
Voice 25KHz 669-672 773.1875 803.1875
Voice 25KHz 709-712 773.4375 803.4375
Voice 25KHz 749-752 773.6875 803.6875
Voice 25KHz 873-876 774.4625 804.4625
Channels labeled “Campus” are subject to ERP and Service Area limitations. See section 3.12, Paragraph “F” for additional information.

PROCESS FOR HANDLING UNFORMED REGIONS

The Implementation Subcommittee recommends that all Regions use the following pre-planning methodology to facilitate coordination with adjacent Regions. This procedure will provide a spectrum allotment for adjacent Regions that do not immediately form a Committee.
Counties or other geographic subdivisions within 70 miles of the Regional border need to share spectrum with the adjacent Region(s). The appropriate ratio of channels shall be allotted to counties
in adjacent Regions based upon each county’s population. A 25 kHz building block will be used to
distribute spectrum between the Regions. A description of the demographics of the affected border
areas shall be included.
The requirements for adjacent Region concurrence will require a waiver if the adjacent Region has
not yet formed. The Region filing the Plan must use the pre-planning procedure outlined above. The waiver request must be filed concurrently with the Plan and contained in the cover letter.

The following form is an electronic copy of the signed PFD versions from Region 24's adjacent regions accompanying this document.

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

I.

II. INTRODUCTION

1. This is a mutually agreed upon Inter-Regional Coordination Procedures Agreement (Agreement) by and between the following 700 MHz Regional Planning Committees,

Region XX

Region XX

II. INTER-REGIONAL COORDINATION AGREEMENT

2. The following is the specific procedure for inter-Regional coordination which has been agreed upon by Regions 24, X, XX, XX, XX, XX, XX, XX and XX 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. [2] 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.

II. 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:

(i) Unconditional concurrence;

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

[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.

(iii) 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.

g. 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.

h. 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).

i. 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

3. IN AGREEMENT HERETO, Regions 4,13,15,16,17,24,26,34 and 39 do hereunto set their signatures the day and year first above written.

Respectfully,

[all signatories to agreement]

_____

_____

_____

_____

Date: _____

Appendix I

DTV transition

Frequency Availability through the DTV Transition

(NOTE: DTV transition continues to be a topic discussed across the country. Region 24 is fortunate to be relatively unencumbered with regard to primary 700 MHz licensee broadcasters operating high power analog TV stations on channels 63-64 or 68-69. KSMOTV

Channel 62 operates in the Kansas City area and will encumbered some of the 63-68 channel pair in the Kansas City operating area. Region 24 will continue to distribute DTV transition information to its members.

4.1.1.1.1 On August 14, 1996, the FCC released a* Sixth Further Notice of Proposed Rule Making *in the digital television (DTV) proceeding. A portion of the spectrum recovered from TV channels 60-69 when DTV is fully deployed "could be used to meet public safety needs."[3] By Congressional direction in the Balanced Budget Act of 1997, the FCC reallocated 24 MHz of spectrum to Public Safety services in the 769-775 MHz and 794-806 MHz bands. The statute required the FCC to establish service rules, by September 30, 1998, in order to start the process of assigning licenses. The rules that the FCC established by September 30, 1998, "provided the minimum technical framework necessary to standardize operations in this spectrum band, including, but not limited to: (a) establishing interference limits at the boundaries of the spectrum block and service areas; (b) establishing technical restrictions necessary to protect full-service analog and digital television service during the transition to digital television services; (c) permitting public safety licensees the flexibility to aggregate multiple licenses to create larger spectrum blocks and service areas, and to disaggregate or partition licenses to create smaller spectrum blocks or service areas; and (d) ensuring that the new spectrum will not be subject to harmful interference from television broadcast licensees" [4].

In April 1997, the FCC assigned a second 6 MHz block of spectrum to each license (or permit to construct) holders of full power, analog, television broadcast station (NTSC) in order to

[3] Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service,
MM Docket No. 87-268, *Sixth Further Notice of Proposed Rule Making*, 11 FCC Rcd 10,968, 10,980
(1996) (*DTV Sixth Notice*).

[4] FCC 98-191, 1st R&O and 3rd NPRM on WT Docket No. 96-86 Operational & Technical Requirements or the 700 MHz Public Safety Band, para.4.

construct a digital television station (DTV). Secondary low power television stations (LPTV), secondary translators and boosters (TX), mutually exclusive applications for new stations, and application filed after a cut-off date did not receive a second 6 MHz allotment for DTV. The FCC
established about a 10 year timeline for those stations with a DTV assignment to construct a DTV
station, cease NTSC transmissions, and return one of the two 6 MHz blocks of spectrum to the FCC. Target date for the end of analog television (NTSC) transmission was set for December 31, 2006.

Congress provided several market penetration loopholes (>85% households served, all 4 major networks converted, etc) allowing NTSC operations to continue past the December 31, 2006
date. While there are over 100 NTSC full power stations in this band, there are also about 12 DTV
assignments. The DTV assignments might continue operations past the December 31, 2006 date for

two reasons. 1) They must find a suitable channel below channel 60 to move to, which may be their
own NTSC assignment. They may not be able to find another allocation until other NTSC stations
have ceased operations and returned a channel below 60 to the FCC. Or, 2) their license does not expire until after 2006 (most are licensed into 2007 or 2008).

Protection of Public Safety from future TV/DTV Stations

Public safety base and mobile operations must have a safe distance between the co-channel or adjacent TV and DTV systems. This typically means that a co-channel and adjacent channel base and
DTV stations. The FCC wants the number of situations where the public safety licensee has to coordinate its station with the existing TV stations kept to a minimum. The Commission's decisions
in the reallocation of spectrum to DTV implemented two requirements, which will help public safety
systems to protect TV/DTV stations and reduce the number of coordination's. The first requirement
is that full power UHF-TV stations can no longer apply for channels 60-69 or modifications in channels 60-69, which would increase the stations' service areas, which creates a known environment
for public safety licensees. The second requirement is that since only existing TV station licensees can
apply for DTV channels, the applicants and their proposed locations are already known.
Also, the low power TV stations and translators already on channels 60-69 are secondary and must cease operations if they cause harmful interference when a primary service, like land mobile,
comes into operation. The secondary Low Power TV stations already on channels 60-69 cannot apply
for the new Class A protection status.

Spectrum Overview

700 MHz Public Safety Band

The FCC designated 769-775 MHz for base-to-mobile transmissions and 799-805 MHz for mobileto-
base communications. In addition, base transmit channels in TV Channel 63 are paired with mobile channels in TV Channel 68 and likewise that base channels in TV Channel 64 are paired with mobile channels in TV Channel 69. This provides 30 MHz separations between base and mobile transmit channel center frequencies. This band plan was suggested because of the close proximity of TV Channels 68 and 69 to the 806-824 MHz band, which already contains the transmit
channels for mobile and portable radios (base receive).
Mobile transmissions are allowed on any part of the 700 MHz band, not just the upper 12 MHz. This will facilitate direct mobile-to-mobile communications (*i.e.*, not through a repeater) that are often employed at the site of an incident, where wide area communications facilities are not available or desired. Allowing mobile transmissions on both halves of a paired channel is generally
consistent with FCC rules governing use of other public safety bands.

Non-uniform TV Channel Pairing

There are currently geographical areas where, either licensed or otherwise protected fullservice analog or new digital, television stations are currently authorized to operate on TV Channels 62, 63, 64, 65, 67, 68, and 69.[5] During the DTV transition period, an incumbent TV station occupying one or more of the four Public Safety channels (63, 64, 68, 69) or the three adjacent channels (62, 65, 67) may preclude pairing of the channels in accordance with the band plan defined above. Therefore, to provide for cases where standard pairing is not practicable during the DTV transition period, the FCC will allow the RPCs to consider pairing base-to-mobile channels in TV Channel 63 with mobile-to-base channels in TV Channel 69 and/or base-to-mobile channels in TV Channel 64 with mobile-to-base channels in TV Channel 68. Because such non-standard channel pairing may cause problems when the band becomes more fully occupied, the FCC expects the RPCs to permit such non-standard channel pairing only when absolutely necessary, and the FCC may require stations to return to standard channel pairing after the DTV transition period is over. However, the FCC will not permit non-standard channel pairing on the nationwide interoperability channels in the 700 MHz band because of the need for nationwide uniformity of these channels.

[5] *See Reallocation, Notice of Proposed Rule Making,* 12 FCC Rcd at 14,141, 14,177-78 and 14,182-83.

At least three issues must be considered before deciding upon non-uniform channel pairing:

1) Preliminary analysis, looking at current incumbent TV stations, shows few geographic areas where non-uniform pairing allows early implementation of 700 MHz systems. As DTV Transition progresses, and TV stations vacate the band, this situation might change.

2) If interoperability channels must be uniform, operation on I/O channels will be blocked until all incumbent TV stations are cleared, even though General Use channels may be implemented earlier.

3) If I/O channels must follow uniform pairing, and general use & reserve channels can be implemented using non-uniform pairing, narrowband voice subscriber equipment must operate on 3 different channel pairings - 39 MHz (764-767 paired with 803-806 MHz), 30 MHz, and 21 MHz (773-776 paired with 794-797 MHz). Likewise, there will be 3 different channel pairing for wideband channels. No vendors have volunteered to build equipment & systems for non-uniform pairing, yet.

TV/DTV Protection

During the DTV Transition period, public safety must consider all co-channel and adjacent channel TV and DTV stations within about a 160 mile radius.

For public safety channel pair 63/68, public safety must consider six TV/DTV channels - cochannels 63 and 68, as well as, adjacent channels 62, 64, 67, and 69.

-100
-90
-80
-70
-60
-50

-40
-30
-20
-10
-6 -3 0 0 +3 +6
Measured NTSC Signal
-100
-90
-80
-70
-60
-50
-40
-30
-20
-10
-6 -3 0 0 +3 +6
Measured NTSC Signal
CH-62 CH-63 CH-64
Fixed Transmit,
Mobile Talk-around Transmit,
&
Control Station & Mobile Receive
CH-67 CH-68 CH-69
Fixed Receive
&
Control Station & Mobile Transmit
NB
Voice
WB
Data
NB
Voice
WB
Data
NB
Voice
WB
Data
NB
Voice
WB
Data

Measured (off-the-air) Analog TV Signal

vs

700 MHz Public Safety Assignments

HAVE 2 CO-CHANNEL AND 4 ADJACENT CHANNELS
TO CONSIDER FOR EACH 700 MHz PAIRED BLOCKS OF SPECTRUM
CH-62 CH-63 CH-64
-6 -3 0 Fd, MHz 0 +3 +6
Lower Adjacent Co-Channel Upper Adjacent
Fixed Transmit,
Mobile Talk-around Transmit,
&
Control Station & Mobile Receive
-6 -3 0 Fd, MHz 0 +3 +6
Lower Adjacent Co-Channel Upper Adjacent
CH-67 CH-68 CH-69
Fixed Receive
&
Control Station & Mobile Transmit

DTV Emission Mask

vs

700 MHz Public Safety Assignments

HAVE 2 CO-CHANNEL AND 4 ADJACENT CHANNELS
TO CONSIDER FOR EACH 700 MHz PAIRED BLOCKS OF SPECTRUM
NB
Voice
WB
Data
NB
Voice
WB
Data
NB
Voice
WB
Data
NB
Voice
WB
Data

For public safety channel pair 64/69, public safety must consider five TV/DTV channels; co-channels 64 and 69, as well as, adjacent channels 63, 65, and 68.

It may only take one TV/DTV station to block operations on one, the other, or both public safety channel pairs. For a public safety system at 500 watts ERP and 500 ft HAAT, co-channel TV

stations can block a 120 mile radius and adjacent channel TV/DTV stations can block a 90 mile radius.

Since base stations transmitters are located only on channels 63 and 64, LMR mobile only TV/DTV protection spacing on channels 68 and 69 may be shorter than LMR base TV/DTV

protection on channels 63 & 64.

TV/DTV Protection Criteria

Public safety applicants can select one of three ways to meet the TV/DTV protection requirements: (1) utilize the geographic separation specified in the 40 dB Tables of 90.309; (2) submit an engineering study to justify other separations which the Commission approves; or (3) obtain concurrence from the applicable TV/DTV station(s).

90.309 40 dB D/U Tables

The FCC adopted a 40 dB desired (TV/DTV) to undesired (LMR) signal ratio for co-channel operations and a 0 dB desired/undesired (D/U) signal ratio for adjacent channel operations. The D/U ratio is used to determine the geographic separation needed between public safety base stations
and the Grade B service contours of co-channel and adjacent channel TV/DTV stations. The D/U signal ratio is used to determine the level of land mobile signals that can be permitted at protected
fringe area TV receiver locations without degrading the TV picture to less than a defined picture quality. In other words, the D/U signal ratio indicates what relative levels of TV and land mobile signals can be tolerated without causing excessive interference to TV reception at the fringe of the
TV service area.

Desired and undesired contours are not quite the same thing. Desired analog TV contours are defined as F(50,50), meaning coverage is 50% of the places and 50% of the time. Undesired land mobile or interference contours are defined as F(50,10). For Digital TV, the desired contours
are defined as F(50,90), while the undesired land mobile contour are still F(50,10).

Land mobile and analog TV services have successfully shared the 470-512 MHz band (TV Channels 14-20) within a 50 mile radius of eleven major cities since the early 1970's based upon providing a signal ratio of at least 50 dB between the desired TV signal and undesired cochannel
land mobile signal (D/U signal ratio) at a hypothetical 88.5 km (55 mi) Grade B service contour and an adjacent channel D/U signal ratio of 0 dB at the same hypothetical Grade B service
contour. These separation distances also protected the land mobile systems from interference from
the TV stations. In 1985, recognizing that 50 dB D/U was too conservative, the FCC proposed to expand land mobile/TV sharing to other TV channels and proposed that the geographic separation
and
mobile system cannot operate in areas where TV stations already exist. The public safety systems that
will operate in the 700 MHz band for some locations in the U.S. and its possessions must wait until
the transition period is over and the TV/DTV stations have moved to other channels before beginning
operations. In other areas, channels will be available for public safety operations. During the transition period, public safety stations must be acutely aware of the TV allocations for both TV

requirements for co-channel operations be based on a D/U signal ratio of 40 dB rather than 50 dB.
That proceeding was put on hold pending completion of the DTV proceeding, which has now been
completed. In the 470-512 MHz band, the FCC also relied on minimum separation distances based
on the various heights and powers of the land mobile stations (HAAT/ERP separation tables) to prevent harmful interference.
Since this simple, yet conservative, method was successful, the FCC decided to use this same method, the 90.309 HAAT/ERP Separation Tables, to administer LMR to TV/DTV receiver protection criteria for the services in the 700 MHz band.
Co-channel land mobile base station transmitters are limited to a maximum signal strength at the hypothetical TV Grade B contour 40 dB D/U below desired 64 dBu F(50,50) analog TV signal level, or 24 dBu F(50,10). The FCC adopted a 0 dB D/U signal ratio for adjacent channel operations. Adjacent channel land mobile transmitters will be limited to a maximum signal of 64 dBu F(50,10) which is 0 dB D/U below the TV Grade B signal of 64 dBu F(50,50) at the TV station
Grade B contour of 88.5 km (55 miles). A typical TV receiver's adjacent channel rejection is at least 10-20 dB greater than this level, which will further safeguards TV receivers from land mobile
interference.

4.2

T
R
T
R

LMR to Analog TV Co-channel Interference

LMR
Repeater
LMR Repeater
Antenna w/
500 watt ERP,
< 500 ft HAAT,
& Vertical
Polarization
Portable Radio
<3 watts
Mobile Radio
< 30 watts
LMR Control Station
Antenna w/ HAAT & AGL,
Directional Gain, &
Vertical Polarization
NTSC
TV 62-69
RCVR
TV Rcvr at Grade B Contour
w/
9.1 meter Antenna AGL,
IGNORING
Horizontal Polarization,
Directional Yagi Antenna
w/ Gain = 10 dB &
Front/Back Ratio = 14 dB,
& Line Loss = 4 dB
TV 62-69
XMTR
TV antenna w/
up to 5000 watt ERP,
> 500 ft HAAT,
& Horizontal
Polarization
64 dBu F(50,50)
horizontally polarized
TV Signal

The equivalent ratios for a DTV station's 41 dB F(50,90) desired field strength contour are land mobile 17 dB F(50,10) contour for co-channel and land mobile - 23 dB F(50,10) contour for adjacent channel.

The Tables to protect TV/DTV stations are found in Section 90.309 of the Commission's rules. These existing Tables cover co-channel protection based on a 40 dB D/U ratio using the separation methods described in Section 73.611 of the Commission's rules for base, control, and mobile stations, and for adjacent channel stations for base stations based on a 0 dB D/U ratio. However, the original considerations in 470-512 MHz band under Section 90.309 were different in that mobiles were limited in their roaming distance from the base station (less than 30 miles) and mobiles were on the same TV channel as the base station.

Control and mobile stations (including portables) are limited in height (200 ft for control stations, 20 ft for mobiles/portables) and power (200 watts ERP for control stations, 30 watts for mobiles, 3 watts for portables). Mobiles and control stations shall afford protection to co-channel and adjacent channel TV/DTV stations in accordance with the values specified in Table D (co-channel

frequencies based on 40 dB protection for TV and 17 dB for DTV) in § 90.309.
Control stations and mobiles/portables shall keep a minimum distance of 8 kilometers (5 miles) from all adjacent channel TV/DTV station hypothetical or equivalent Grade B contours (adjacent channel frequencies based on 0 dB protection for TV and -23 dB for DTV). This means that control
and mobile stations shall keep a minimum distance of 96.5 kilometers (60 miles) from all adjacent
channel TV/DTV stations.
Since operators of mobiles and portables are able to move and communicate with each other, licensees or coordinators must determine the areas where the mobiles can and cannot roam in order
to protect the TV/DTV stations, and advise the mobile operators of these areas and their restrictions.

Engineering Analysis

Limiting TV/land mobile separation to distances specified in the 40 dB HAAT/ERP Separation Tables found in 90.309 may prevent public safety entities from fully utilizing this spectrum in a number of major metropolitan areas until after the DTV transition period ends. Public safety applicants will be allowed to submit engineering studies showing how they propose to meet the appropriate D/U signal ratio at the existing TV station's authorized or applied for Grade B service
contour or equivalent contour for DTV stations instead of the hypothetical contour at 88.5 km. This would permit public safety applicants to take into account intervening terrain and engineering
techniques such as directional and down-tilt antennas in determining the necessary separation to provide the required protection. Public safety applicants who use the engineering techniques must
consider the actual TV/DTV parameters and not base their study on the 88.5 km hypothetical or equivalent Grade B contour. If land mobile interference contour does not overlap the TV Grade B
contour (or DTV equivalent), then engineering analysis may be submitted to the FCC with the application.

LMR @ 500 watts ERP & 500 feet HAAT
(~45 miles)

This method is most useful with lower power TV stations whose Grade B contours are much smaller than the hypothetical
55 mile (88.5 km) Grade B contour or have directional patterns

55 miles
~45 miles
55 mile
hypothetical
Grade B Contour
TV Licensed
64 dBu F(50,50)
Contour
Public Safety
Service Area
<63 miles
<30 miles
TV LMR
LMR
24 dBu F(50,10)
Contour
500 watts ERP
500 feet HAAT
Area not
usuable by
Public Safety
reduced >45 miles
separation to
<35 miles
Less than 110 miles

700 MHz Band - Public Safety to Co-Channel TV Spacing using Engineering Analysis per 90.545(c)(1)(ii)

Actual LMR 24 dBu contour just touches Licensed TV/DTV 64 dBu contour

Note that 200 ft AGL limitations on 700 MHz control stations is much higher than the 100 ft AGL limitation used at UHF. Limiting control station antenna height and/or ERP may greatly reduce land mobile to TV contour spacing.

Also, note that analysis for TV/DTV receivers uses 30 ft (10 m) antenna height whereas, analysis for land mobile subscribers uses about a 6 ft (2m) antenna height.

TV/DTV Short-spacing

4.3 Public safety applicants will also be allowed to "short-space" even closer if they get the (written) approval of the TV stations they are required to protect. Public safety applicants need to determine the station's intended market area vs its hypothetical Grade B contour area. Alternately, the TV/DTV station may be shortspaced
against another TV/DTV station, limiting their area of operation, but does not affect LMR operations.
4.4 Instead of each agency negotiating with a TV/DTV station individually, they may want to combine into a single group or committee and negotiate together.

55 miles
Offset Antenna Pattern
TV Licensed
TV 64 dBu F(50,50)
Contour
LMR
24 dBu F(50,10)
Contour
Public Safety
Service Area
<30 miles
35 miles
LMR
55 miles
55 mile
hypothetical
Grade B Contour
TV 500 watts ERP
500 feet HAAT
Less than
minimum 90 miles

700 MHz Band - Public Safety to Co-Channel TV Spacing using Engineering Analysis per 90.545(c)(1)(ii)

Actual LMR 24 dBu contour just touches Actual TV/DTV 64 dBu contour

Ability to consider the effects of terrain may greatly

reduce the separation required between LMR and TV.

TV/DTV Height Adjustment Factor

4.5 In order to protect certain TV/DTV stations which have extremely large contours due to unusual height situations, such as a television station mounted on top of Mount Wilson near Los Angeles, California, the FCC incorporated an additional height adjustment factor which must be used by all public safety base, control and mobile stations to protect these few TV/DTV stations and afford the land mobile stations the necessary protection from the TV/DTV stations. The equation necessary to calculate the additional distance from the hypothetical or equivalent Grade B contour is found in the rules section 90.545(c)(2)(iii).

CANADIAN AND MEXICAN BORDER REGIONS

The FCC typically takes one of two approaches. They either postpone licensing of land mobile stations within a certain geographic distance (*e.g.,* 120 km (75 miles)) of Canada and Mexico, or permit interim authorizations conditioned on the outcome of future agreements. Because international negotiations can take many months or even years to finalize, the FCC took the later approach and adopted certain interim requirements for public safety licenses along the Canada and Mexico borders, providing that the licenses are subject to whatever future agreements
the United States develops with the two countries.

Nevertheless, existing mutual agreements with Canada and Mexico for the use of these bands for UHF television must be recognized until further negotiations are completed. The US negotiated an agreement with Mexico of DTV operations near the US/Mexican border in July 1998.

The US just negotiated an agreement with Mexico of DTV operations, and limited non-broadcast operations on 746-806 MHz, near the US/Canadian border in September 2000. Existing agreements
recognize existing TV and/or DTV allotments and planning factors within a specified distance of the border. The Canadian Letter of Understanding also acknowledges that US plans to use 746-806
MHz for non-broadcast purposes and provides planning criteria (40 dB D/U) to protect Canadian TV/DTV receivers.

Additionally, public safety facilities within the United States must accept interference from authorized channel 60-69 TV transmitters in Canada and Mexico in accordance with the existing agreements. Since the locations of the Canadian and Mexican analog TV assignments and DTV allotments are known, the public safety applicants can consider the levels of harmful interference to
expect from Canadian and Mexican TV/DTV stations when applying for a license. Both Canada and Mexico have been informally notified that the Commission has changed its allocated use of TV
channels 60-69, and the Commission will discuss the possibility of mutually compatible spectrum
use with Canada and Mexico.

Appendix J Meeting Announcements

This Region 24 700 MHz Regional Planning Committee report is a documentation of the Region 24

700 MHz process. Every item in this document has been reviewed and is pertinent to public safety
700 MHz implementation in Missouri and in accordance with plans for allowing 700 MHz channels
to be used in Missouri's adjacent states of Arkansas, Oklahoma, Kentucky, Tennessee, Illinois, Kansas, Nebraska and Iowa. We look forward to working with the regional planning committees in
these states to better the potential for public safety to have the tools available to complete their mission of protecting life and property in their respective states.

Regards,

Steven J. Makky, Sr.
Chairperson, Region 24 Regional Planning Committee
St. Charles County Sheriff's Department
December 28, 2007