REGION 22
(MINNESOTA)

REGIONAL PLAN

FILED WITH THE FCC PER WT DOCKET 02-378

FOR THE USE OF 700 MHZ PUBLIC SAFETY CHANNELS

PER

FCC WT DOCKET 13-87

MINNESOTA REGION 22 PLANNING COMMITTEE

SEPTEMBER 24, 2015

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1.0 REGIONAL CHAIRPERSON

The Region 22 Planning Committee held an initial meeting January 8, 2001 at the Minnesota Department of Transportation, Arden Hills Training Center. A Chair, Vice Chair and Secretary were elected. **Current officers are listed on the FCC's website at:**

http://publicsafety.fcc.gov/pshs/public-safety-spectrum/700-MHz/rpc-directory.htm

Chair

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2.0 RPC MEMBERSHIP

The By-laws adopted (Attachment 1) by the Region 22 committee were written to allow and encourage broad participation by all interested parties. The section of the by-laws that deals with membership and voting reads as follows:

> For purposes of this Article, the term "member," unless otherwise specified, refers to both voting and non-voting members.
>
> **Number, Election and Qualification.** The Regional Committee shall have two classes of members, "voting members" and "non-voting members." New members may be added at annual, special, or regular meetings.
>
> **Voting Members**. Voting members shall consist of one 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, and the Metropolitan Radio Board. 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 that he or she represents.
>
> **Non-Voting Members.** Non-voting members are all others interested in furthering the goals of public safety communications.
>
> **Tenure.** In general, each member shall hold MEMBERSHIP from the date of acceptance until resignation or removal.
>
> **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.
>
> **Suspension 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.
>
> **Resignation.** A representative may resign by delivering written resignation to the chairman, vice-chairman, treasurer or secretary of the Regional Committee or to a meeting of the members.

With the opportunity to represent ones' agency at any given time, attendance at the meetings varied depending on the agenda items. Those voting members attending at least one meeting are listed in Attachment 2.

The Officers of the Region 22 RPC were originally defined as:

> **Number and qualification.** The officers of the Regional Committee shall be a chairman, vice-chairman, secretary/treasurer and such other officers, if any, as the voting members may determine. The officers must be voting members of the Regional Committee.

Due to poor attendance and the inability to assemble a quorum at many of the meetings, the Board was increased to allow the Board to conduct business if a quorum was not present. The following language change was approved at the April 8, 2003 RPC meeting:

> The Board of Directors shall consist of 7 members, one Chair, one Vice-Chair, one Secretary/Treasurer, and four directors, representing five different service types (Police, Fire, EMS, Transportation, etc), and three different levels of government (State, County, City, etc).

A quorum was originally defined as:

At any meeting of the members, a quorum exists when the following minimum roster is met:

Two Officers of the Regional Planning Committee
Five separate governmental entities
Five different service types (i.e. Police, Fire, EMS, Public Works, etc)
Eleven voting members

The definition of a quorum was changed, at the April 8, 2003 RPC meeting, to read:

> At any meeting of the members, a quorum exists when the following minimum roster is met:
>
> One of the following Board Members: Chair, Vice-Chair, or Secretary/Treasurer
> Five separate governmental entities
> Five different service types (i.e. Police, Fire, EMS, Public Works, etc)
> Nine voting members

If the minimum roster is not met, a majority of the members of the Board, one member must be Chair, Vice-Chair, or Secretary/Treasurer, shall constitute a quorum.

Quorum of the minimum roster group governs over the actions of Board alone. The minimum roster quorum can over rule action of Board; however the Board is empowered to act upon issues when a quorum of voting members does not attend a meeting.

3.0 DESCRIPTION OF THE REGION

Region 22 is defined as the entire State of Minnesota. Minnesota is in the north central United States. Near the geographic center of North America, it is bordered on the north by the Canadian provinces of Manitoba and Ontario, on the west by North Dakota and South Dakota, on the south by Iowa, and on the east by Wisconsin and Lake Superior.

The area of Minnesota is 86,943 sq mi, of which 4,780 sq mi is inland water and 2,546 sq mi is a portion of Lake Superior under the state's jurisdiction. Minnesota thus ranks 12th in area among the 50 states. From north to south the state measures 406 mi, and from east to west it measures 358 mi at its maximum extent and about 180 mi at its narrowest point. The mean elevation is about 1,200 ft.

There are 87 counties, more than 2700 cities and townships as well as 11 tribal governments. There are five major cities in Minnesota comprising about 19% of the total population (2000):

Minneapolis -	382,700
St. Paul (Capitol)	288,000
Duluth	86,044
Rochester	91,264
Bloomington	85,400

The Minneapolis/St. Paul metropolitan area is comprised of 7 counties and has a total population of 2,642,056 (53.7% of entire State population). Hennepin County, the state's largest, has a total population of 1,116,200 (22.5% of entire State population). The growth rate in the metro area from 1990 to 2000 was 15.4%. The metro area is located in the east central portion of the State, on the Minnesota/Wisconsin border. The neighboring Wisconsin counties, Polk, St. Croix, and Pierce, are also experiencing rapid growth. St. Croix County is most accessible to the metro area via I-94, and has seen an 11% population growth in the last three years.

According to the 2000 census, the following demographics describe Minnesota:

Total Population: 4,919,479

State Rank in Population: 21st

Highest Point - Eagle Mountain - 2,301 feet (701 m) above sea level

Lowest Point - 602 feet above sea level at Lake Superior

Number of rivers and streams: 6,564 (92,000 miles).

Number of lakes (over 10 acres): 11,842 (4,967,510 acres).

The State of Minnesota has 87 counties. There are 486 police departments and Sheriff's Offices in the State. Of the 486 agencies, 400 have fewer than 25 officers/deputies. 13 agencies have more than 100 officers/deputies. The total number of full time licensed peace officers in Minnesota is 9,295. Minnesota has 567 fire departments, 309 EMS providers, and more than 1000 maintenance and public works organizations.

All interoperability channels in the VHF, UHF (450 MHz), 700 MHz and 800 MHz bands shall be administered by the Interoperability Committee of the Minnesota Statewide Emergency Communications Board (SECB).

Local, regional and statewide mutual aid agreements exist throughout the State. Cooperative planning efforts have been undertaken in the past to facilitate interoperability in the VHF and UHF bands. The fire plan, EMS plan, MIMS plan, and the MINSEF plan are a few examples of the more widely recognized agreements. It would be nearly impossible to compile all of the mutual aid agreements that exist in the State for the purpose of this report. Police, fire, and EMS agencies within the region frequently train and respond with one another, and the need to communicate between agencies exists on a daily basis, in some areas.

Nearly all agencies in the region operate a VHF radio system for primary voice communications. There are some UHF systems in use, particularly in the metropolitan St. Paul/Minneapolis area. Commencing in 1999, a region wide 800 MHz trunked radio system was constructed in the 7 metro counties plus the adjoining Chisago and Isanti counties to the north. The largest users of the system currently are the State Patrol, Department of Transportation, Metropolitan Council, Anoka County, Hennepin County, Carver County, and the City of Minneapolis. In 2003, the availability of significant federal grant money has increased the number of agencies migrating to the region wide system. It is anticipated that Ramsey County, the Metropolitan Airports Commission, as well as several larger cities in the metro area will be using the system by mid-2005. The system is currently being extended to the cities of St. Cloud and Rochester. Additional agencies are expected to participate in the future. The intent of the system is to provide a communications network for all public safety and public service entities, thereby facilitating reliable interoperability.

Until recently, the State had four primary channels used for interoperability within a service type: MINSEF – Statewide police (155.475), Statewide Fire (154.295), Statewide EMS (155.340), and MIMS/Point to Point (155.370). There was also a UHF Metropolitan emergency frequency in use by some of the large agencies in Hennepin and Ramsey counties. In addition to the features inherent with a wide area trunked system, the development of the region wide 800 MHz system included several different enhancements to interoperability in the metropolitan area. Two additional VHF repeater

channels have been constructed to facilitate communication between VHF users and 800 MHz users. Three of the 800 MHz interoperability channels (ICALL and ITAC 4) now have equipment installed and operating to facilitate communications with 800 MHz users traveling through the area.

The FCC has allocated eleven 12.5 KHz VHF channels and four UHF channels to facilitate interoperability, and these channels have been incorporated into the statewide Interoperability plan at 112 sites within Region 22 (Minnesota).

VHF	UHF
151.1375	453/458.2125
154.4525	453/458.4625
155.7525	453/458.7125
157.2250	453/458.8625
157.2500	
157.2750	
158.7375	
159.4725	
161.8500	
161.8250	
161.8750	

4.0 NOTIFICATION PROCESS

The notification process for the RPC meetings was primarily accomplished through e-mail. The original meeting included a notice published in the State Register, the APCO Bulletin (Attachment 3) as well as notification to the Minnesota Sheriff's Association and the Minnesota Chiefs of Police Association. Subsequent e-mails were distributed to all attendees and re-distributed to e-mail lists of interested persons. At the time of this 700 MHz planning process, the metro area 800 MHz system was completed and put into operation. Mn/DOT was also working to implement a statewide 800 MHz system. As part of these efforts, radio communications issues were at the forefront for most Public Safety agencies. Meeting notes were taken at each meeting (Attachment 4).

Our original understanding was that the tribal police agencies were notified through their association with the Minnesota Chiefs of Police Association. It was discovered in 2003 that several of the tribal police agencies were not members of the Association, and therefore have likely not learned of the planning process. A letter was sent to the Minnesota Indian Affairs Council after that discovery was made (Attachment 5).

The Division of Homeland Security and Emergency Management (HSEM) is a division of the Minnesota Department of Public Safety. A member of the HSEM attended the initial meeting. The Department of Transportation maintains and operates the communications system for the Department of Public Safety. The Department of Transportation has been an integral part of the planning process.

The meetings were originally scheduled for the second Wednesday of each quarter at 10:00 am. The day was changed to the second Tuesday of the quarter, beginning July, 2002, due to a conflict with regularly scheduled meetings involving members of the Metropolitan Radio system. The meetings were moved to different locations around the State, to encourage participation by agencies in greater Minnesota. The meetings were also available throughout the State at the Mn/DOT District Offices through a state-wide video-conferencing system. Regardless of the location of the "live" meeting, participation was typically limited to a core group of attendees from in and around the St. Paul/Minneapolis area. As the process progressed, the "live" meetings were held in St. Paul, but we continued to broadcast them throughout the state, with limited participation at the remote sites.

5.0 REGIONAL PLAN SUMMARY

5.1 Description of the Planning and Approval Process

The FCC directed the Chairman of the 800 MHz NPSPAC committee to schedule an initial meeting of a Regional Planning Committee (RPC), to establish a plan for allocation and use of these new 700 MHz frequencies. Notices for the meeting were published more than 60 days in advance of the meeting in several venues such as the APCO public safety magazine, the Federal Register, the Minneapolis Star and Tribune news paper. Notices were also distributed at the state APCO training conference and posted on the local chapter web site. Notices were also distributed using existing e-mail lists to parties involved in previous radio planning processes.

The initial meeting was held January 8, 2001, and despite the broad distribution of the notices, there was relatively low attendance. Temporary officers were elected at the first meeting, and the by-laws and officers were finalized at the following meeting. The committee has been meeting quarterly, and notices have primarily been distributed through e-mail following the initial meeting. The meetings were originally held around the State, but eventually held in St. Paul at the Department of Transportation Central Office due to lack of participation by agency representatives from greater Minnesota. These meetings were available throughout the State using Mn/DOT's video-conferencing system.

A work group was formed and discussed some of the more technical aspects of the Plan, presenting their work at the quarterly meetings. Preliminary allocations and technology options were discussed at meetings prior to completion of the NYSTEC model allocation plan. Discussions were also held regarding the use of the State licensed frequencies. After the NYSTEC plan was received, it was reviewed, and a determination was made that Region 22 RPC would not modify that plan.

The Plan was widely distributed via e-mail and printed copies. Comments and concurrence were solicited from adjacent RPC's.

5.2 Deliberators for a Fair and Open Planning Process

The entire planning process was open and we were actively recruiting participation throughout. Despite the typically low turnout, we had a broad representation from different service types (ie police, fire, EMS, transportation). Most of the attendees represented metro area agencies, with occasional attendance from agency representatives from out-state Minnesota. The greatest pressure for additional frequency allocations exists in the metro area, and most out-state areas have all or most of the NPSPAC channels available for use.

5.3 Structure and Procedure for RPC Operation

The RPC structure and procedure for operations were defined by the by-laws (Attachment 1).

5.4 700 MHz Public Safety Spectrum

The Region 22 channel allocation pre-coordinates general use narrowband ~~and wideband data channels~~ including low power and interoperability channels. As per Section 8 and the pre-planning flow-chart of Appendix G, page 62, the plan allots general use channels to geographic areas bounded by county borders. Channels have been coordinated within the region and with adjacent regions. The Regional Plan discusses various methods of increasing spectral efficiency including system sharing, contour analysis and "orphan channel" distribution procedures. The Region 22 RPC has been designated to administer the interoperability channels in accordance with the NCC's recommendations. Region 22 license application and processing procedures are described and documented by the coordination flowchart of Appendix G, page 63.

The basis of the planning process is the FCC's 700 MHz band plan per the fourth MO& O in WT DKT96-86 (TV channels 63/64 and 68/69). The band plan is detailed in the matrix of the Appendix listed under 700 MHz Plan Documents.

The Narrowband channels are designated in 6.25 kHz blocks and can be aggregated to 25 kHz. TV channels 63/64 are comprised of two segments of 480 narrowband base channels and one segment allocated to the National Public Safety Broadband plan. The base channels of the channel pair begin at 769 MHz and end at 775 MHz. TV channels 68/69 are also comprised of two segments of 480 narrowband base channels. The

mobile channels of the channel pair begin at 799 MHz and end at 805 MHZ. A comparison of 700 MHz and 800 MHz NPSPAC Public Safety Channels is shown in Attachment 6.

The Region 22 allotment for the channels of the FCC's 700 MHz band plan is discussed in section 8 and shown as a listing of channels per county and counties per channel in Attachments 7 and 8. The most current listing can be found on the CAPRAD data base.

5.5 Spectrum Allotment Procedure

The goal of the Region 22 RPC was to balance the need for efficient assignment of the limited channels available with the ability of each eligible entity to maintain autonomy, if they choose. The RPC acknowledges that larger, regional systems with many users provide a more efficient use of the channels, but also acknowledges the desire of some agencies to maintain an independent system. The RPC felt that if no resources were allocated to individual eligible entities, some agencies may choose to continue to operate a VHF or UHF system, making interoperability with neighboring agencies less efficient. At the same time, the RPC wanted to encourage radio planning at a county-wide or larger level.

The County government is encouraged to develop a plan for the use of the 700 MHz channels within their area. If a county plan is submitted to, and approved by, the RPC within 5 years following the adoption of the Region 22 RPC Plan, channels may only be licensed consistent with that plan for a maximum period of 8 years following the adoption of the Region 22 Plan by the FCC. If no plan is developed, the county will have exclusive licensing authority for only the initial 5 years following the adoption of the Region 22 Plan by the FCC. After 5 years (if no county plan is approved) or 8 years (if a county plan is approved), any eligible entity within the County may apply for a license.

Region 22 supports the National Coordination Committee's pre-assignment rules and recommendations listed in the Appendix under Technical Reports. The RPC will notify counties that county pool allotments are available upon FCC approval of the plan.

5.6 NCC Guidelines

In general and unless otherwise noted Region 22 will adhere to the published National Coordination Committee Implementation Guidelines, for 700 MHz Public Safety Regional Planning Committees. The Regional Planning Committee has established a process to approve applications and interpret the plan.

5.7 Channel Usage Guidelines

The narrowband General Use channels are allotted to geographic areas bounded by county borders per the NYSTEC methodology described in detail in section 8. These channels can be licensed by counties, municipalities or other public safety eligibles within the county, subject to the timetable described in section 5.5. The RPC supports and promotes multi-agency systems that allow for regional/wide area coverage within the region.

UNASSIGNED POOL (former Reserved Channels)

The twenty-four 12.5 kHz former Reserved Channels are now General Use channels in the Part 90 Rules. With the exception of the eight identified Deployable Trunked Channels below, the RPC now holds the remaining sixteen channels in a "reserved (unassigned) pool" for use by any public safety entity for which the local allotment is shown to be insufficient for system requirements. This Unassigned pool is intended to be a collection of channels available to accommodate technical difficulties in fully utilizing the applicant's associated allotment and to resolve coordination conflicts in congested areas. Vehicular repeater applications can be accommodated with the assignment of frequencies from this Unassigned pool. Channels shall be selected by the applicant and reviewed for approval by the RPC. Applicants are required to demonstrate the need for assignment of all Unassigned pool channels requested in the submitted application(s). The requested assignments must be in compliance with the provisions of this section (Section 5).

The sixteen channels (base transmit shown) in the Unassigned Pool are as follows:

UNASSIGNED POOL

6.25 KHz Channels	12.5 kHz Center Freq (MHz)
77/78	769.48125
157/158	769.98125
197/198	770.23125
221/222	770.38125
237/238	770.48125
277/278	770.73125
301/302	770.88125

317/318	770.98125
643/644	773.01875
699/700	773.36875
723/724	773.51875
763/764	773.76875
803/804	774.01875
843/844	774.26875
859/860	774.36875
923/924	774.76875

DEPLOYABLE TRUNKED STATIONS

The RPC adopts the NPSTC recommendation for 700 MHz Nationwide Deployable Trunked Channels as a standard for six of the eight channels utilized in Region 22 for Deployable Trunked Systems. The RPC adds to these six channels, the 12.5 kHz channels 683/684 (773.26875 center frequency) and 779/780 (773.86875 center frequency) to comprise the standard set for 700 MHz Deployable Trunked Systems.

The RPC shall oversee applications for the licensing of deployable trunked channels in conjunction with the Interoperability Committee of the Minnesota Statewide Emergency Communications Board (SECB).

The following eight channels (base transmit shown) are used in Region 22 for Deployable Trunked Systems:

DEPLOYABLE TRUNKED

6.25 kHz Channels	12.5 kHz Center Freq (MHz)	FCCor REGION 22
37/38	769.23125	NPSTC/FCC
61/62	769.38125	NPSTC/FCC
117/118	769.73125	NPSTC/FCC
141/142	769.88125	NPSTC/FCC
683/684	773.26875	REGION 22
779/780	773.86875	REGION 22
883/884	774.51875	NPSTC/FCC
939/940	774.86875	NPSTC/FCC

AIR GROUND CHANNELS

Eight former Secondary Trunking Interoperability channels are now designated in the Rules as Air-Ground channels. These channels are intended communication between low-altitude aircraft and associated ground stations (medivac helicopters and base stations or mobile repeaters used by first responders). These stations must be licensed according to the Rules, whereby the mobile station onboard aircraft is limited to 2 Watts ERP and may transmit on the mobile and, where appropriate, base (talk around) side of the channel pair. Applications for stations operating within 315 km (~196 miles) of the Canadian border will be considered on a case by case basis.

The RPC designates this set of channels as an Interoperability solution for Region 22, and as such, applications for licensing of the Air-Ground channels shall be administered by the Interoperability Committee of the Minnesota Statewide Emergency Communications Board (SECB).

The following eight channels (base transmit shown) are available to license Air-Ground stations.

AIR GROUND CHANNELS

6.25 KHz Channels	12.5 kHz Center Freq (MHz)
21/22	769.13125
101/102	769.63125
181/182	770.13125
261/262	770.63125
659/660	773.11875
739/740	773.61875
819/820	774.11875
899/900	774.61875

5.8 Usage Guidelines

All systems operating within the Region having five or more channels will be required to be trunked. Exceptions will be permitted on the trunking

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

Those systems having four or less channels may be conventional or trunked although as counties experience rapid growth in the future it may be prudent for both economic an operational considerations that counties pool their channels and implement a multi-county trunked system.

Public Safety communications at the State level, as it impacts the Region, will be reviewed by the RPC. Statewide public safety agencies will submit their communications plans for review if they utilize communications systems within the Region and those portions of such systems must be compatible with the Regional plan.

Where smaller conventional 700 MHz needs are requested, those frequencies to be utilized must not interfere with the region's trunked systems. The 700 MHz trunked radio system is to be considered the higher technology at this time and in greater compliance with FCC guidelines. The amount of interference that can be tolerated depends on the service affected. Personal life and property protection shall receive the highest priority and disruptive interference with communications involved in these services in an area shall not be tolerated. Any co-channel interference within an authorized area of coverage will be examined on a case by case basis by the RPC.

5.9 Statewide Trunking Plan

The Statewide trunking project is a significant planning effort which encourages the development of a multi-agency, multi-tasking shared network on a statewide basis. Current plans are to augment 800 MHz with 700 MHz channels at sites where there are insufficient 800 MHz channels to meet loading requirements. This plan will assist agencies in complying with the usage guidelines described in this document. Agencies planning to use 700 MHz channels are encouraged to review the progress of this project and plan their systems accordingly.

Authority

Minnesota Statute 403.36 defines the requirements and establishes the authority for the Departments of Public Safety, Transportation and Administration to develop a plan for a statewide, shared, trunked public safety radio system. Under directive from the 2002 legislature a Statewide Planning Committee was created and subsequently approved a plan for implementing a statewide shared trunked radio system.

Plan

The purpose of the statewide radio project, also known as the Allied Radio Matrix for Emergency Response system (ARMER) is to improve safety, security, and mobility of the public by providing a reliable communication system that meets the needs of state agencies and their local government partners. By creating partnerships with other units of government and public service organizations there will be improved interoperability between the levels of government and the sharing of resources to build a statewide communication infrastructure on which to move into the future in an integrated, practical and strategic way.

The infrastructure will be designed around open standards to insure additional public and private entities have the opportunity, and are in fact encouraged, to plug-in to the statewide infrastructure as it is completed. As the system is completed throughout various regions, it is anticipated that the added capacity of a statewide infrastructure will provide the opportunity for integration and full interoperability of public safety communication.

Phased Implementation Plan and Schedule

The first phase of the state infrastructure has been completed as part of the Metropolitan Radio Board system. As local government participation in the metro system (Phase Two) continues, the State will proceed with the phased deployment of state backbone systems in greater Minnesota

(phases Three-Six). Each phase will consist of implementing components of the system within two to three complete State Patrol districts. For operational purposes, complete districts will be converted to the new system, rather than portions of a district or specific highway corridors.

The work to be completed during each phase consists of constructing and or installing the following components: towers, 700/800 MHz base stations, Interop base stations (VHF), controllers, switching equipment, and microwave transmitters/receivers.

Special consideration will be given to the interoperability system (Interop) that will be needed to permit communications between users of the new 700/800 MHz trunked system and the users who choose not to migrate or join the new system. An attempt will be made to use the available 800 MHz channels first, if technically viable.

- Phase Three- Phase Three will begin in FY2004. This phase will provide coverage throughout 23 counties in the Rochester and St. Cloud Patrol districts.

- Phase Four – Phase Four, which will begin in FY2005 or one year after the start of Phase Three. This phase will cover the Duluth and Brainerd Patrol districts. The two districts cover 12.5 counties (half of St. Louis Co.)

- Phase Five – Phase Five will begin in FY2006 or 1 year after the start of Phase Four. This phase encompasses three Patrol districts – Mankato, Marshall, and Detroit Lakes. This phase will include 31 counties.

- Phase Six – Phase Six, will begin in FY2007 or 1 year after phase Five begins. This phase will cover the Virginia and Thief River Falls Patrol districts. These two districts include 11.5 counties.

5.10 Periodic Re-Evaluation of Allotments

To accommodate population change, changing technologies and to maximize spectrum efficiency, a periodic re-evaluation of allotments and assignments is anticipated. The RPC shall conduct a formal documented review of the plan every five years after its initial acceptance by the FCC. This process will insure an opportunity for agencies that have an immediate spectrum need and the funding to implement a system without delay. It will also provide a mechanism to periodically review all un-constructed frequency assignments.

5.11 Interoperability Channels

The narrowband voice and data interoperability channels (sixty-four at 6.25 KHz bandwidth) are defined on a nationwide basis. Appendix A - Corrected shows the designation of these channels as defined by the 700 MHz National Coordination Committee (NCC). Since they are nationwide channels, each channel must have the same usage within each region and across regional borders.

~~Within the 12 MHz of spectrum designated for high capacity, wide bandwidth (50 to 150 kHz) channel usage, there are eighteen 50 kHz (or six 150 kHz) channels designated for wideband interoperability use.~~

Agencies requesting 700 MHz frequencies must either construct its own interoperability capability or include a Memorandum of Understanding per Appendix B from another agency demonstrating that interoperability will be accomplished.

5.12 Administration of Interoperability Channels

The Region 22 Planning Committee has **delegated the responsibility for administering the Interoperability channels to the Interoperability Committee of the Statewide Emergency Communications Board (SECB), referred to as the Statewide Interoperability Committee in the Plan. The Statewide Interoperability Committee shall administer the 700 MHz Interoperability channels** per the NCC/**NPSTC** standards and recommendations as described in section 6. A plan for these channels should include, but not be limited to interoperability operations on the 700 MHz interoperability channels. VHF and UHF narrowband interoperability channels of the Public Safety pool (90.20) will also be administered.

5.13 Low Power Channels

The FCC has designated twenty-four 6.25 kHz channel pairs for low power use for on-scene incident response purposes with transmitter power not exceeding 2 watts (ERP). Eighteen channel pairs are to be assigned on a non-exclusive basis and are to be shared by all public safety eligible.

Channels 9-12 paired with 969-972 and 959-960 paired with 1919-1920 are set aside Nationwide for itinerant use. Operation on these channels may include analog modulation with an aggregation of two channels for 12.5 kHz bandwidth allowed. Project 25Common Air Interface is required for digital mode of operation on these channels.

Temporary base and mobile relay stations are allowed for on scene operation with an antenna height limit of 5.1 meters above ground.

Additional 700 MHz exclusive Scene of Action (SOA) channels for specific applications were not designated since six have already been assigned by the Region 22 NPSPAC Committee for the ARMER project described in section 5.9. It is anticipated that radios will be capable of both 700 and 800 MHz operation so the need is fulfilled by the following NPSPAC SOA channels;

NPSPAC Pair	SOA Use
825	All Users
826	All Users
827	Public Safety 1
828	Public Safety 2
829	Fire & EMS only, portables only
830	Fire & EMS only, portables only

5.14 Incumbent Co-Channel and Adjacent Channel Broadcast TV Stations

There are no full power TV or digital television stations (DTV) on channels 62 through 69 (758-806) in Minnesota or in bordering areas of adjoining states.

There are 51 low power (LPTV) and translators (TX) in the state including three channels in the Minneapolis – Saint Paul metropolitan area. Several additional stations are near Minnesota in bordering states. These types of stations are secondary and must cease operation if they cause harmful interference when a primary service, like land mobile comes into operation. The secondary LPTV stations already on channels 63 through 69 cannot apply for the new class A protection status.
A list of TV licenses can be found at the FCC's video division's TV query web site, www.fcc.gov/gov/fcc-bin/tvg?state.

The RPC will support an applicant's effort to remove a TV station by working through the FCC. See sample notifications by RPC to secondary TV stations in Appendix AA.

Canadian TV and DTV assignments must be considered if located near the border. The FCC will permit interim authorization at locations north of line A (90.7) or within 75 miles of the Canadian border as per 90.533. Public Safety transmitters must not cause harmful interference to Canadian TV stations and must comply with interference protection criteria in Section 90.545 for TV/DTV stations in Canada.

Public Safety stations must accept any interference from Canadian broadcast stations. The terms of licenses may change subject to an US-Canada international agreement.

5.15 Protection Ratios

There are two protection ratios to be considered for coordinating general narrowband channels. One is for the co-channel case; the other is for the adjacent channel case. The ratio provides 35 dB desired/undesired signal ratio for co-channel assignments and 20 dB desired/undesired ratios for the adjacent channel case. These ratios are described in section 8 and are recommended by the National Coordinating Committee.

5.16 Channel Loading Requirements

Applicants must show compliance with the minimum-loading table, shown as follows. This may be done in accordance with the extended implementation Section 90.629 of the Commissioner's rules.

Minimum Loading Table:

		Units per Channel	
		Conventional	Trunked
a.	"Emergency" use (Police, Fire, Medical)	70	100
b.	Non-"Emergency" use (all others)	100	130

While these quantities are considered appropriate for most typical systems, it must be realized that the ratio of channels needed to the quantity of mobile/portable units is not necessarily linear as the quantity of mobile units increases in large trunked systems. Justification for the number of requested channels in larger systems should not be solely based on the quantity of mobile and portable units expected to be used in the system. A mathematical calculation, similar to that used in the telephone industry for trunked circuit system design that takes into consideration such things as the "busiest hour" and "message length". "Number of units in service", "unit call rate", and "grade of service" may be required to further substantiate the desired channels assignments.

The RPC will approve an application based on the applicant's demonstration of compliance with the minimum loading requirements or by providing a loading schedule as required by the FCC to meet the extended implementation rule.

5.17 CAPRAD Database

The Regional Planning Committee will use the NLECTC/CAPRAD frequency allocation database, specifically designed for use in the 769-775/799-805 MHz public safety band. This database contains both frequency and pre-assignment information. The RPC will use the database to review adjacent Region's pending and/or complete pre-assignments for assistance in completing their respective plans. The FCC's designated public safety frequency advisors will use the CAPRAD database during the application process (pre-coordination). Frequency advisors, as well as RPC's are required to maintain the database as the applications are processed and granted by the commission.

5.18 Re-Assignment of Frequencies

All applicants for 700 MHz spectrum must submit a plan for the abandonment of any currently licensed frequencies under 512 MHz that are presently being used for the activity to be conducted on the new 700 MHz channels.

The Regional Planning Committee will have the freedom to consider below-700 MHz public safety bands in further development of regional plans, but the licensing of channels in these bands would continue to be conducted through existing frequency coordination procedures.

Lower band frequencies being replaced by 700 MHz channels cannot be automatically retained or "handed down" to another agency in their respective jurisdiction. Such re-use of frequencies can only be accomplished through the regular procedures, followed with a new application.

The time frame allowed for phasing out of lower band frequencies and into 700 MHz will normally be one (1) year. Any agency requiring more than one year must provide documents stating the reasons for the delay and give the estimated time of completion. Such extensions are subject to approval by the FCC.

5.19 FCC License Applications

The following describes the procedure and information required when submitting FCC license applications. All applicants must obtain approval by the RPC before the frequency coordination process can proceed. To request channels from Region 22 a full application package must be submitted online to the NPSTC sponsored CAPRAD database at http://caprad.nlectc.du.edu/login/home The application must include an FCC form 601 and the supplemental information required when submitting

applications. Supplemental information may be provided to the Regional Chairman by mail if it cannot be provided on-line. The following supplemental data must be provided for the coordinator's use to determine compliance with the Regional Plan.

1. A statement that describes the purpose of the proposed radio equipment, for example is it a replacement for an existing system, a new communications system, or a modification to an existing system?
2. A description of the applicants legal jurisdiction such as "the County of _____". A map, such as a county highway map or a U.S. geological or topographical map should be used to draw an outline of the applicant's jurisdiction.
3. The proposed location of the base station(s) must be marked on the map.
4. An accurate, graphic illustration on the map of the 40 dBu contour expected from each base station. In certain situations the RPC may require an interference prediction map using the current version of TIA/EIA TSB88 guidelines.
5. A statement describing the proposed loading of the channel(s) being requested. Quantities, that can be verified, of vehicles, mobile radios, portable transceivers and control stations that will be using the system must be listed along with the projected dates by which they will be placed in service. Portable transceivers should be in two categories, (1) those used full time as the sole communicating device for the bearer and (2) those used only part time to supplement a vehicle installed radio unit or other part time usage.
6. A list of "orphaned channels" as per Section 8.8. It is expected that these channels will be returned to the database and be reassigned by the RPC.
7. A list of any lower band frequencies that will be replaced by the projected 700 MHz system.
8. The manner in which "interoperability" with other jurisdictions, will be accomplished.

5.20 RPC Application Approval

The Regional Planning Committee will designate a person(s) to screen applications to determine compliance with the Regional Plan. If there are issues of non-compliance, the RPC will convene a frequency meeting to resolve the issues. Upon successful review, the Regional Chair, *or designee*, will approve the application and submit it through the CAPRAD database to the applicant's preferred FCC Certified Coordinator for processing. For most applications the review process will be completed

within 20 working days. The CAPRAD database will reflect the approved application and place the channels for the proposed system in “pre-license status”. In case of a conflict, the coordinator will return the application to the applicant with a copy to the planning committee. It is expected that the three parties will work to resolve the conflict.

5.21 FCC Approval

Upon issuance of the license by the FCC, the coordinator will update the coordinator database with actual license parameters. If after twelve months (or longer for slow growth) the FCC does not receive construction notification from the licensee, the coordinator will delete this license from the database.

5.22 Construction Requirements

An applicant will have twelve months to place a system in operation and to confirm compliance with the construction/coverage requirements. Construction may be extended up to five years if application is made pursuant to section 90.155 (b), which permits local government entities a longer period for placing a station in operation where the applicant submits a specific schedule for the completion of each portion of the entire system, which has been approved and funded for implementation in accordance with that schedule. The applicant must file FCC form 601, main form and schedule K, with the Commission no later than 15 days from the applicable construction/coverage deadline. See 47 C.F.R. section 1.946 (d).

6.0 INTEROPERABILITY CHANNELS

The purpose of interoperability channels is to provide a means for public safety agencies to effectively respond to mutual aid situations by facilitating communication with each other. **Licensing and operation of all 700 MHz Interoperability channels shall be administered by the Interoperability Committee of the Minnesota Statewide Emergency Communications Board (SECB).** Base stations on the I/O channels require licensing. Mobile stations do not require a license.

The narrowband voice & data interoperability channels (sixty-four at 6.25 kHz bandwidth) are defined on a nationwide basis. Appendix A shows the designation of these channels as defined by the 700 MHz National Coordination Committee (NCC). Since they are nationwide channels, each channel must have the same usage within each Region and across Regional borders. They have been sub-divided into different service categories.

The Digital Interoperability Standard for the conventional-only mode of operation on the narrowband voice and data interoperability channels adopted by the NCC and approved by the FCC, is the ANSI/TIA 102 Standards (i.e., Project 25 digital protocols).

There are 2 Calling channel sets and 30 Tactical channel sets. Channel Sets are comprised of two 6.25 kHz bandwidth channels each. The Tactical channel sets are subdivided into the following recommended categories:

4 for Emergency Medical Service
4 for Fire Services,
4 for Law Enforcement Services,
2 for Mobile Repeater operation,
2 for Other Public Services, and
12 for Public Safety General Services.
2 for Data

6.1 Standardized Nomenclature:

Standardized nomenclature is recommended nationwide. All 700 MHz public safety subscriber equipment using an alphanumeric display of at least eight digits should be programmed to show the recommended label from the Table in Appendix A - Corrected when programmed to operate on the associated 700 MHz channel set. The Table shows the recommended label for equipment operating in the mobile relay (repeater) mode. When operating in direct (simplex) mode, the letter “D” should be appended to the end of the label.

6.2 Calling Channels

The 700 MHz licensees will be responsible for monitoring the interoperability calling channels. The RPC will develop operational guidelines.

Because the 700 MHz band will be initially encumbered by broadcast television in some areas, two of the interoperability channels sets are reserved as "Calling Channels". The RPC will define when and where the two calling channels are to be used. These calling channels, which appear in the Table of Interoperability Channels (Appendix A) as “7CAL59” and “7CAL75” must be monitored, as appropriate, by licensees who employ interoperability infrastructure in the associated channel group. In addition to the usual calling channel functions, the calling channels may be used to notify users when a priority is declared on one or more of the tactical interoperability channels. Any system plan submitted for approval must include a design for the interoperability channels that will meet their purpose as defined by the FCC.

6.3 Tactical Channels

All Interoperability channels, except as described below, shall be used for conventional-only operation.

Normally, users will 'call' a dispatch center on one of the "Calling Channels" and be assigned an available tactical channel. Deployable narrowband operations (voice, data, and trunking) shall be afforded access to the same pool of channels used for similar fixed infrastructure operations. In the event of conflict between multiple activities, prioritized use shall occur. The Region 22 plan will not set aside additional channels for interoperability use within the region. It is expected that the sixty-four FCC designated channels (6.25 kHz) will be sufficient for the region.

6.4 Encryption

Use of encryption is prohibited on calling channels and permitted on all other interoperability channels. A standardized encryption algorithm for use on the interoperability channels must be TIA/EIA IS AAAA-A Project 25 Block encryption protocol.

6.5 Deployable Systems

This plan supports the use of deployable systems to provide additional coverage and capacity to minimize the expense of the alternative of implementing a fixed infrastructure. These prepackaged systems can be deployed when needed to provide additional support for interoperability.

Conventional deployable systems should be capable of operating on any of the interoperability tactical channels. The agencies that are a part of a multi agency trunked system are encouraged to have trunked deployable systems on those channels designated for trunked use. The RPC will develop operational procedures for these systems.

6.6 Trunking on the Interoperability Channels

Trunking the Interoperability channels on a secondary basis shall be limited to operation on eight specific 12.5 kHz bandwidth channel sets, divided into two subsets of four 12.5 kHz bandwidth channels. One subset is defined by 7TAC58 through 7EMS61 and the other by 7FIR65 through 7LAW68.

Any licensee implementing base station operation in a trunking mode on Interoperability Channels shall provide and maintain on a continuous basis (24 hr x 7 day), at its primary dispatch facility, the capability to easily remove one or more of these interoperability channels. Interoperability Channels must be removed from trunking operation when a conventional access is necessary having priority equal to or higher than the trunked use.

While it may be desirable for the Regional Planning Committee to permit trunked radio systems to incorporate one or more of the Interoperability channels into a single trunking system as a means of enhancing the use of the system for interoperability purposes (and by implication allow those channels to be routinely used for normal day-to-day communications), care must also be given to ensure that those channels do not become such an integral part of the trunked system operation that it becomes politically and technically impossible to extract them from the trunked system in the event of an emergency event having higher priority. For this reason, the NCC Interoperability Subcommittee recommends that the Regional Planning Committee limit the number of Interoperability channels that may be integrated into any single trunked system to the following amounts:

For systems having 10 or fewer "general use" voice paths allocated, one (1) trunked Interoperability Channel set is permitted. For systems having more than 10 "general use" voice paths allocated, two (2) trunked Interoperability Channel sets are permitted.

The Regional Planning Committee may allot additional Interoperability Channel set(s) for trunked systems having more than 20 "general use" voice paths allocated upon a showing of need and upon a determination that assignment of the Interoperability Channel set(s) will not adversely impact availability of those channels to other trunked and/or conventional radio systems in the area (e.g. a single consolidated trunked system servicing all public safety agencies in an area might satisfy this criterion). The maximum number of Interoperability channel sets for trunked systems permitted for use by an individual licensee is four.

The channels (two 6.25 kHz bandwidth pairs) in Reserve Spectrum immediately adjacent to the channels where secondary trunking is permitted [(21, 22), (101, 102), etc. are available for secondary trunking, but only in conjunction with the adjacent Interoperability 12.5 kHz bandwidth channel pair in a trunked system and will be administered by the RPC.

6.7 Standard Operating Procedures on the Trunked I/O Channels for I/O Situations above Level 4

The safety and security of life and property determines appropriate interoperable priorities of access and/or reverting from secondary trunked to conventional operation. In the event secondary trunked access conflicts with conventional access for the same priority, conventional access shall take precedence. Access priority for “mission critical” communications is recommended as follows:

1. Disaster and extreme emergency operations for mutual aid and interagency communications;
2. Emergency or urgent operation involving imminent danger to life or property;
3. Special event control, generally of a preplanned nature (including Task Force operations);
4. Single agency secondary communications.
   [Priority 4 is the default priority when no higher priority has been declared.]

For those systems employing I/O channels in the trunked mode, the RPC will set up interoperability talk groups and priority levels for those talk groups so that it is easy for dispatch to determine whether the trunked I/O conversation in progress has priority over the requested conventional I/O

use. The RPC will also determine whether a wide-area I/O conversation has priority over a local I/O conversation.

6.8 Data Only Use of the I/O Channels

Narrowband data-only interoperability operation on the Interoperability channels on a secondary basis shall be limited to two specific 12.5 kHz bandwidth channel sets. One set is defined by 7DAT71 and the other by 7DAT87.

6.9 DELETED

6.10 Region 22 Administration of Interoperability Channels

Licensing and operation of all 700 MHz Interoperability channels shall be administered by the Interoperability Committee of the Minnesota Statewide Emergency Communications Board (SECB).

6.11 Minimum Channel Quantity

If all calling and tactical voice channels are desired, the minimum channel quantity is 8 I/O channel slots in each subscriber unit. Including direct (simplex) mode on these channel sets, up to 16 slots in each radio will be capable of being programmed for I/O purposes. Backbone issues are deferred to the RPC. Subscriber units, which routinely roam through more than one jurisdiction up to nationwide travel may require more than the minimum channel quantity.

The “CALL”ing channel sets (7CAL59 and 7CAL75) shall be implemented in all voice subscriber units in repeat-mode and direct (simplex) mode. “Direct” mode is permitted in the absence of repeat operation or upon prior dispatch center coordination. If the local CALLing channel set is not known, 7CAL59 shall be attempted first, then 7CAL75. Attempts shall be made on the repeater mode first then on the direct (simplex) mode.

A minimum set of Tactical channels shall be implemented in every voice subscriber unit in the direct (simplex) mode. Specific channel sets are shown below.

- 7TAC63 & 7TAC79 channel sets

- 7TAC67 & 7TAC83 channel sets
- 7TAC73 & 7TAC89 channel sets

Voice subscriber units subject to multi-jurisdictional or nationwide roaming should have all I/O voice channels, including direct (simplex) mode, programmed for use.

The need for interoperability channel programming will be determined as standards are developed, and systems are built.

6.12 Direct (Simplex) Mode

In direct (simplex) mode, transmitting and receiving on the output (transmit) side of the repeater pair for subscriber unit-to-subscriber unit communications at the scene does not congest the repeater station with unnecessary traffic. However, should someone need the repeater to communicate with the party who is in “direct” mode, the party would hear the repeated message, switch back to the repeater channel, and join the communications. Therefore, operating in direct (simplex) mode shall only be permitted on the repeater output side of the voice I/O channel sets.

6.13 Common Channel Access Parameters

Common channel access parameters will provide uniform I/O communications regardless of jurisdiction, system, manufacturer, etc. Thus, the Calling and TAC channels (all of them) should include a common NAC as the national standard. The secondary, trunked I/O channels would be excluded in the trunked mode. However, when reverted to conventional I/O, the common NAC would then apply. This national requirement should apply to base stations and subscriber units. This should apply to fixed or temporary operations for tactical or other mutual aid conventional I/O use.

Common channel access parameters for all voice I/O shall utilize the default values (ANSI/TIA/EIA-102, BAAC-2000, approved April 25, 2000) provided in every radio regardless of manufacturer.

7.0 ADDITIONAL SPECTRUM SET ASIDE FOR INTEROPERABILITY WITHIN THE REGION

The RPC will not designate any additional general use channels for interoperability use. The consensus is that the 32 narrowband channels ~~and 18 wideband channels~~ are sufficient for interoperability use.

8.0 ALLOCATION OF GENERAL USE SPECTRUM

The Narrowband general use spectrum refers to the block of frequencies designated for local public safety users. The FCC has allocated six hundred and sixteen 6.25 kHz bandwidth channel pairs for general use. Region 22's plan distributes spectrum in 25 kHz building blocks, each comprised of four 6.25 kHz or two 12.5 kHz bandwidth channels.

The channels are distributed according to an allotment plan developed for the National Public Safety Telecommunications Council NPSTC and the National Institute of Justice by the New York Technology Enterprise Corporation and Syracuse Research Corporation, NYSTEC. The methodology of the Safety Pool Allotments, (Narrowband General Use Channel Set) documentation of Methodology and Results" January 31, 2003. The report can be found at www.NPSPAC.org and Appendix AAA.

8.1 Summary of The NYSTEC Methodology:

- Use population and population density characteristics in evaluating capacity needs. Employ PSWAC like capacity requirement models to introduce increased accuracy in the modeling process.
- Use terrain data for service-area evaluation and interference prediction. This will allow greater accuracy in the process, and will result in more efficient reuse of the spectrum.
- Use contour intersections to evaluate the validity of pre-allotment channel sets. Build upon past experience in developing quasi-optimal spectral allotment solutions.
- Pre-allot "pool" channels in aggregate 25 kHz blocks. Allow a minimum of four blocks per allotted (county like) area – three for voice, and one for data. Allot additional spectrum based upon projected need (normalized by the spectrum available), and local availability.
- Allot all areas of the U.S. as listed in the in the NYSTEC Report in the Appendix under Technical Reports. which includes fifty states and Puerto Rico.
- When considering allotable spectrum blocks, make no attempt to work around either U. S. International broadcast-television services. Many of these station assignments are either temporary, or subject

to change, and working around them would have resulted in allotment inefficiencies.

Each county allotment is a contiguous 25 kHz block consisting of:

- (4) 6.5 kHz channels or
- (2) 12.5 kHz channels

It maintains at least 250 kHz separation with other allotments within each county. Each county received a minimum of 5 of these 25 kHz blocks. The remaining was allotted according to the capacity model, and reuse constraints. Terrain and U.S. borders affect availability. For areas along the Canadian border above line A the RPC must note that any public safety allocations within that area subject to future treaties with these counties.

8.2 Narrowband Allotments

The Narrowband allotment completed by NYSTEC and adopted by the RPC is shown as a listing of channel assignments in Attachments 7 and 8. The most current listing can be found on the CAPRAD database.

8.3 Wideband Data Channel Allotments

The Second Report and Order provides for wideband operations on a waiver basis. Wideband operations may be permitted in the consolidated narrowband portion or the internal public safety guard band portion of the public safety broadband spectrum. Under certain circumstances public safety entities may request a waiver to operate in the upper 1.25 megahertz of the public safety broadband spectrum. All wideband operations shall be secondary to the primary narrowband or broadband operations, as applicable. Wideband licensees operating under a secondary status pursuant to a waiver shall be required to resolve any harmful interference caused to primary operations including modifying or terminating wideband operations.

8.3.1 Wideband Application Procedures.
Requests for a waiver for wideband operations shall be considered by the RPC on a case by case basis. Unless prohibited by FCC rules, any frequencies within the consolidated narrowband portion or the internal public safety guard band portion may be utilized for secondary wideband operations. Counties and adjacent regions that are allocated specific narrowband general use channels that are impacted by secondary wideband waivers will be notified of the secondary application. The Sheriff or the County Administrator of the impacted county will be requested to provide the RPC an update of any implementation plans for construction of facilities on the specified frequencies. The RPC will approve all waiver requests that do not disrupt plans that are underway to utilize the requested frequencies for other purposes within five years. Upon determination that the requested frequencies are not included in an implementation plan for other purposes within five years, a letter from the RPC or state licensee, as applicable, confirming that the proposed wideband deployment will not disrupt any regional or state planning efforts that are underway will be issued.

8.3.2 Applicable FCC Rules.
The following FCC Rules pertaining to wideband waiver operation were adopted in the Second Report and Order.

§ 90.1432 Conditions for waiver to allow limited and temporary wideband operations in the 700 MHz Public Safety spectrum.
(a) Wideband operations in the 700 MHz Public Safety spectrum. Wideband operations are prohibited in the public safety allocation of the

700 MHz band public safety spectrum except where the Commission has granted a waiver pursuant to §§ 1.3 and 1.925 of this chapter and subject to the additional conditions and requirements specified below. Grants of waiver are restricted to the deployment of a wideband system in the consolidated narrowband portion or the internal public safety guard band portion of the public safety broadband spectrum. Where spectrum in the narrowband segment or internal guard band segment is unavailable for wideband operations, public safety entities may request a waiver to operate in the upper 1.25 megahertz of the public safety broadband spectrum.

(b) Any public safety entity seeking to conduct wideband operations within the public safety allocation must file a request for waiver that is accompanied by an application for authorization and includes the following information:

(1) a letter from the Public Safety Broadband Licensee, confirming that the proposed wideband deployment is not inconsistent with the broadband deployment plan for the affected or adjacent service areas; and

(2) a description of the conditions or transition requirements, if any, agreed to between the applicant and the Public Safety Broadband Licensee.

(c) Additional requirement for wideband operations in the narrowband segment and Internal Guard Band. If an applicant seeks permission to deploy wideband systems in the narrowband segment, its waiver request must also include a letter from the appropriate regional planning committee or state licensee confirming that the proposed wideband deployment will not disrupt any regional or state planning efforts that are underway.

(d) Additional requirements and conditions for wideband operations in the broadband segment. Permission to conduct wideband operations in the broadband segment will be granted only where spectrum in the narrowband segment or the internal guard band is unavailable for wideband operations. In no event will permission be granted to conduct wideband operations in geographic areas scheduled for broadband deployment within the first three years of the build-out plan for the Shared Wireless Broadband Network.

(1) An applicant seeking permission to deploy wideband systems in the broadband segment must have first issued a request for proposal (RFP) that permitted interested parties to submit broadband proposals that are technically consistent with the Shared Wireless Broadband Network.

(2) A request for waiver that seeks permission to deploy wideband systems in the broadband segment must include the following information:

(i) a substantially supported, detailed technical showing demonstrating that insufficient spectrum in the narrowband segment or the internal guard band is available to support the desired wideband operations;

(ii) a showing that rejected responses to the required broadband network RFP were more costly, provided less coverage as measured by

throughput at the network edge, or were otherwise inferior to the accepted wideband proposal; and

(iii) a detailed plan for integration of such wideband system into the Shared Wireless Broadband Network. This plan must specify how and by what date the wideband applicant will integrate its proposed wideband system into Shared Wireless Broadband Network and must include a certification that the public safety entity will not seek reimbursement for any costs involved in converting the wideband system to Shared Wireless Broadband Network upon completion of that network in the applicant's geographic area.

(3) Authority to conduct wideband operations in the broadband segment of the public safety spectrum will be subject to the following conditions:

(i) All devices operating on the wideband system must be designed to interoperate with Shared Wireless Broadband Network;

(ii) All waivers will expire automatically upon the Upper 700 MHz D Block licensee's initiation of service in the service area covered by such waiver.

(e) Secondary status of wideband operations. All wideband operations permitted under this section shall be secondary to the authorized narrowband or broadband applications, as applicable.

(f) License terms for wideband operations. Any secondary license to conduct wideband operations in the public safety spectrum shall have a term of no more than five years.

(g) Renewal of wideband authorization. Any request for renewal of an initial authorization to conduct wideband operations shall be filed not less than 180 days prior to expiration of the license. All renewal requests must include a showing that continued operation of the wideband system is in the public interest and must be accompanied by a letter from the Public Safety Broadband Licensee confirming that continuing wideband operations are not inconsistent with the broadband deployment plan for the affected or adjacent service areas. The license term for any renewal of a license granted under the waiver provisions herein shall not exceed three years. No more than one license renewal will be granted.

(h) Grandfathered wideband STA operations. Upon request, the Public Safety and Homeland Security Bureau may grant a public safety entity that has constructed, deployed, and was operating a wideband system as of July 31, 2007 pursuant to STA to extend the STA grant for periods of no more than 180 days until, but not later than, six months following the selection of the Public Safety Broadband Licensee.

8.4 Allotment Variances:

The general channel allotment can be considered a first cut for frequency planning for the Region. It is however, an essential step of the process in order to ensure coordination between regions. It allows agencies in any location to plan communications systems with a reasonable assurance that enough channels will be available to implement a useful modern communications system. Changes in the plan are expected especially after the five-year review. An agency can apply for any channel regardless of the general allotment plan if it can demonstrate that it meets the plan's coverage/interference criteria, when compared with the plan's co-channel and adjacent channel licensees and allotments and can be coordinated with adjacent regions.

There are circumstances such as where an applicant may require a variance of the maximum service area such as where a site is near a county border or if the user anticipates signal overshoot because of an unusual in-building coverage requirement. At the discretion of the RPC, certain variances in maximum service area may be allowed if there are no co-channel users in that direction. Variances will be considered by the RPC on a case by case basis. The RPC will require applicants to provide detailed coverage/interference predictions in the application process.

8.5 Expansion on Initial Allocation:

In the event that the allocation for any county becomes depleted, the Region Planning Committee shall meet to make further allocations to said county. Should this occur, the applying agency or entity shall submit the proper license and coordination applications with all applicable fees, as in any other licensing request. Allocations will be made based on the initial frequency allocation plan as mentioned above, taking into consideration orphan channels, which were returned to the reserve pool.

8.6 Annexations and Other Expansions:

It is well known that as cities grow, annexations occur. When an expansion of the present city limits of any city currently using 700 MHz system within the spectrum as herein specified occurs, it is understood that the existing system may have to be expanded and its range increased. This is a modification and may be permitted. The increased range of the system will have to be determined at the time of modification to assure non-interference with any other existing system. Where interference is likely, the use of alternate methods of expansion, such as satellite systems or multiple transmitters sites with reduced heights may be necessary. Should the annexation or expansion of a city effectively take in all or most of a county, the allocation for that county may be given to the city if required by said city and not in use or planned to be used by the county. Where more spectrum is not available from the initial

allocation, the rules for expansion of initial allocation, as contained in this plan, shall apply.

8.7 NPSPAC Channels:

If a county has not yet exhausted its 821 MHz allotment, the 700 MHz RPC should work with the applicant encouraging it, where technically appropriate to complete the 800 MHz spectrum. The purpose is to ensure utilization of all allocated spectrums with similar characteristics.

8.8 Orphaned Channels

The narrowband pool allotments will have a channel bandwidth of 25 kHz. These 25 kHz allotments are characterized as “Technology Neutral”, i.e. able 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. The agency shall identify orphaned channels in the request for coordination from the RPC during the license application process.

An orphaned channel presents an opportunity to achieve greater spectrum efficiency by allowing it to be utilized for other applicants on a first-come, first-served basis. Typically, it cannot be used effectively within the same county or adjacent county because of adjacent channel interference restrictions.

An applicant for an orphan channel must demonstrate that it meets the 5 dBu co-channel and 60 dBu adjacent channel interference criteria with the plan assignments and licensees’ in the area. The application must be coordinated with the adjacent regions if it lies within 75 miles of a border area.

8.9 Periodic Re-Evaluation of Allotment

To accommodate population changes, changing technologies, and to maximize spectrum efficiency, a periodic re-evaluation of allotments and assignments is recommended. The RPC will revisit the general ~~and wideband~~ channel allotment every five years on a structured basis with published results. The review will ensure that all agencies have the opportunity to access spectrum commensurate with their needs.

8.10 Trunking Requirements

All systems operating in the Region having five or more channels will be required to be trunked. Those systems having four or less channels may be conventional however, it is strongly recommended that any entity licensing three or more “repeaters” use trunking technology in their system. Exceptions will be permitted only when a substantial showing is made that alternative technology would be at least as efficient as trunking or that trunking would not meet operational requirements. Exceptions will not be granted routinely and strong showings as to why trunking is unacceptable must be presented in support of any request for exception.

Depending on systems loading and the need for multiple systems within an area, operators of wide area systems (including, but not limited to, designated “Monitoring Agencies”) must provide for coordination between area-wide systems and “Monitoring Agencies”. Single municipalities or agencies must restrict design and implementation of their system(s) to provide only the communications needed within its geopolitical boundaries. The use of trunked systems is encouraged, however if the total number of radios in service does not reach minimum loading criteria for a trunked system, that user must consider utilizing the next higher system level. If 700 MHz trunked radio is the smaller system users must consider consolidating their communications systems to formulate one large trunked system.

8.11 Transmitter Combining

The allotment is designed to provide a minimum frequency separation of 0.25 MHz between any two channels assigned to the same eligible at the same site. This separation is provided in order to enable more efficient combining of multiple transmitters to a single antenna. These separated blocks of frequencies also have a maximum size. That is, if the eligible has more frequencies that the maximum size of the combining block, then a second compatible block is created, and so on.

8.12 Definition of “Coverage Area”

“Coverage area” referred to in this plan is that geographical area throughout which the applicant has primary jurisdiction, plus approximately three (3) to five (5) miles, and throughout which the radio “base station(s)” to be installed are intended to provide a minimum received signal strength of 40 dBu (decibels above 1 microvolt, equivalent to approximately 4.6 microvolts across 50 ohms) to the associated mobile stations.

8.13 System Coverage Limitations

Every effort must be made to ensure the most possible re-use (shared) of spectrum by confining signal radiation of a system to only the geographical area throughout which the applicant has primary jurisdiction.

It is recognized however that radio signals do not stop at jurisdiction borders nor do jurisdiction boundaries rarely center around a selected transmitter site. All possible considerations however given in the system's design to achieve this balance of signal propagation to the utmost.
Overlap or extended coverage must be minimized, even where systems utilizing 700 MHz trunked radio systems are proposing to inter-mix systems for cooperative and/or mutual aid purposes.

Antenna heights are to be limited to provide only the necessary coverage for a system. When antenna locations are restricted to only the "high-ground" transmitter outputs and special antenna patterns must be employed to produce only the necessary coverage with the proper amount of ERP.

The following TIA/EIA TSB88-A criteria must be met in the design of communication system utilizing frequencies in this allocation, assuming a 40 dBu service contour is provided by the desired stations throughout the intended service area.

1. The 40 dBu service contour will be allowed to extend beyond the service area by 3 to 5 miles depending on population (urban, rural). See Appendix K
2. The interfering co-channel 5 dBu contour must not overlap the 40 dBu contour of the system being evaluated.
3. An adjacent interfering (25 kHz) channel shall not be allowed to have its 60 dBu coverage overlap the 40 dBu contour of the system being evaluated.

Coverage/Interference evaluation can be analyzed using any of the commonly used coverage models including Bullington, Longley - Rice, Okumura, etc. Longley Rice (50-50-50) with land use is used exclusively by several Public Safety Coordinators.

The location and design of such systems however must anticipate the potential for interference from other systems operating within this plan's guidelines. The criteria listed above are intended to provide protection to only receivers located at the base or mobile relay stations site.

Applicants choosing to operate a system with less that a 40 dBu signal contour within their coverage area should be cognizant that noticeable co-channel interference may be experienced from other co-channel users who have systems conforming to these radiated power limitations.

8.14 Use of Frequencies in Aircraft

The degree to which these 700 MHz channels are to be "re-used within the Region and their assignments in adjacent regions require that their use in aircraft be restricted. Limitations are:

1. A maximum ERP of 1.0 watt above 500 ft. AGL.
2. Avoid using the input frequency to the mobile relay station and use the "talk-around" mode whenever possible.

8.15 Determination of Coverage

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

Received Signal Strength:
For purpose of this plan, received signal strength shall be the determining factor, which defines the actual boundary of the system. The signal level which marks the outer boundary of a system must not exceed 40 dBu.

Antenna Height

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

Effective Radiated Power (ERP).

The ERP is the transmitter output power times the net gain of the antenna system. The actual formula is:

ERP (watt) = Watts x antilog (Net Gain/10)

8.16 Canadian Coordination

Region 22 licensees *North of line A* must accept any interference that may be caused by operations of UHF television broadcast transmitters in Canada and that conditions may be added during the term of the license if required by the terms of international agreements between the United States and the Government of Canada, as applicable, regarding the non-broadcast use of the 764-806 MHz bands. Public Safety licensees are granted subject to the conditions sat forth in 47 C.F.R. Paragraph 90.533.

9.0 AN EXPLANATION OF HOW NEEDS WERE ASSIGNED PRIORITIES IN AREAS WHERE NOT ALL ELIGIBLES COULD RECEIVE LICENSES.

Outside of the immediate Twin City metropolitan area, very few of the 800 MHz NPSPAC channels have been licensed. The RPC feels that adequate channels will be available throughout greater Minnesota in the 700 MHz and 800 MHz bands. The construction of the 800 MHz system in the metropolitan area has addressed many of the needs, and potential needs. The desire of the Metropolitan Radio Board is to focus the system using available 800 MHz resources, and supplement them with 700 MHz at some point in the future, if necessary. Prior to licensing any 700 MHz channels within a county, all PSAP's within the county must concur. If an agreement cannot be reached, a resolution by the requesting government entity shall be sent to the RPC for consideration. The RPC will work to develop an equitable allocation to meet the needs of those involved. The RPC may approve license applications, without concurrence of all parties.

The following matrix should be used to evaluate competing applications within the region. The matrix will be used when there are multiple agencies requesting the same channels within the same time frame. Total evaluation points will add to 100.

- Priority will be given to applicants involved with protection of life and property with consideration of the population being served. (15 points)

- Intersystem & Intra-system interoperability (10 points)

  However well the proposed system will be able to communicate with other levels of government and services during an emergency on "regular" channels not the I/O channels. Interoperability must exist among many agencies to successfully accomplish the highest level of service delivery to the public during a major incident, accident, natural disaster or terrorist attack. Applicants requesting 700 MHz spectrum shall inform the region of how and whom they have been achieving interoperability in their present system.

  The applicant shall stipulate how they will accomplish interoperability in their proposed system (gateway, switch, cross-band repeater, console cross patch, software defined radio or other means) for each of the priorities listed below.

  1. Disaster and extreme emergency operation for mutual aid and interagency communications.

  2. Emergency or urgent operation involving imminent danger to life or property.

  3. Special event control, generally of a preplanned nature (including task force operations).

4. Single agency secondary communications. Priority 4 is the default priority when not other priority is declared and includes routine day to day (non-emergency) operations.

- Loading (30 points)

  Is the system part of a cooperative, multi-organization system? Is the application an expansion of a existing 800 MHz system? Have all 821 channels been assigned (where technically feasible)? A showing of maximum efficiency or a demonstration of the systems mobile usage pattern could be required in addition to loading information. Based on population, number of units (if number of units, are they take home, how many per office), what the talk groups?

- Spectrum Efficient Technology (10 points)

  How spectrally efficient is the system's technology? Trunked systems are considered efficient "as well as any technological system feature, which is designed to enhance the efficient use of the system and provide for the efficient use of the spectrum."

- Systems Implementation Factors (20 points)

  Demonstrate funding, demonstrate system planning. Provide a construction and implementation schedule. Is this going to be slow growth (within the next five years) or is it something that's ready to be implemented now? A document stipulating what the agency is planning to implement signed by an official within the organization who handles the money is required. Some concerns expressed in this category were: how one legally provided a document that proves subsequent year funding; the money does not start flowing until the equipment is in place; some agencies cannot bond until they have the frequencies.

- Geographic Efficient (10 points)

  The ratio of subscriber units to area covered and the channel reuse potential were the two subcategories in this one. "The higher the ratio (mobiles divided by square miles of coverage) the more efficient the use of the frequencies. Those systems which cover large geographic areas will have a greater potential for channel reuse and will therefore receive a high score in this subcategory."

- Turnback Channels (5 points)

  Consider the number of VHF and UHF channels given back. Consider the extent of availability and usability of those channels to others.

10. AN EXPLANATION OF HOW ALL THE REGION ELIGIBLES' NEEDS WERE CONSIDERED, AND TO THE EXTENT POSSIBLE, MET.

The entire planning process took place through open meetings, and solicited input from interested and affected parties. See Section 4 for further discussion about the process. The CAPRAD system will be used for the license application process. See section 9 for further discussion of how needs were considered.

11. ADJACENT REGION COORDINATION

The Draft Plan was posted on the CAPRAD site following approval by the RPC. A printed copy was also delivered by US Mail to the Chairperson of each adjacent region.

Dispute resolution

i) The following is the procedure for inter-regional coordination when a license application is made that is consistent with the Regional Plan.

ii) Intra-regional review and coordination takes place, including a technical review resulting in assignment of channels.

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

iv) 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.

v) 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, 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

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.

vi) 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. 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.

vii) 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.

viii) 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).

ix) 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.

12. A DETAILED DESCRIPTION OF HOW THE PLAN PUT SPECTRUM TO THE BEST POSSIBLE USE

Previous sections of the Plan discuss channel loading and the expectation that trunking technology will be used in most 700 MHz systems. Throughout the planning process, we evaluated all frequency resources that were available for use, and how these resources will best meet the needs of all users.

13. A DETAILED DESCRIPTION OF THE FUTURE PLANNING PROCEDURES

The Plan will be reviewed and updated every five years. Changes to the plan can be made more frequently when necessary. The 700 MHz RPC will take efforts to

coordinate meetings of the other radio planning bodies to ensure that conflicting decisions are not being made.

14. A CERTIFICATION BY THE REGIONAL PLANNING CHAIRPERSON THAT ALL PLANNING COMMITTEE MEETINGS, INCLUDING SUBCOMMITTEE OR EXECUTIVE COMMITTEE MEETINGS WERE OPEN TO THE PUBLIC.

"I hereby certify that all planning committee meetings, including subcommittee or executive committee meetings were open to the public.

Signed

_____"

Steve Pott, Region 22 Chairperson
Chief Deputy
Washington County Sheriff's Office

700 MHz Regional Plan
Attachments

Attachment 1	Region 22 By-laws
Attachment 2	Voting Membership
Attachment 3	Original Meeting Notices
Attachment 4	Meeting minutes
Attachment 5	Letter to Minnesota Indian Affairs Council
Attachment 6	Comparison of 700 MHz & 800 MHz NPSPAC Public Safety Channels
Attachment 7	Region 22 – Minnesota Channel Allotments by Class
Attachment 8	Region 22 – Minnesota Allotments by FCC Channel
Attachment 9	Grouping and Allotment Plan for 700 MHz State Channels

APPENDIX

The appendices which involve National Coordination Committee Documents can be accessed from the website; www.NPSTC.org When on the NPSTC homepage, select CAPRAD on the left side of the screen. When on the CAPRAD homepage, select DOCUMENTS which can be found under the Public Information heading.

TECHNICAL REPORTS

Appendix -	Generation of the National 700 MHz Public Safety Allotments (Narrowband General Use Channel set) Documentation of Methodology and Results
Appendix -	Population, Area, and Capacity Model Data County Contours in graphics format

700 MHz Plan Documents

Appendix -	700 MHz Band Plan per Fourth MO&O
Appendix -	State Channel Sharing Plan – Northeast Option

700 MHz Regional Planning Guidebook

Appendix B	Memorandum of Understanding Template
Appendix C	Sharing Agreement Template
Appendix D	Sample Dispute Resolution Process
Appendix E	Sample Agenda
Appendix F	Sample Bylaws Template
Appendix G	Pre-Planning Flow Chart Coordination Flow Chart
Appendix H	Funding Request Form
Appendix I	Sample Public Notice
Appendix J	Recommended Incident Command System
Appendix K	Simplified 700 MHz Pre-Assignment Rules Recommendation
Appendix L	Digital Television (DTV) Transition

Appendix M	700 MHz Band Plan Chart
Appendix N	RPC & SIEC Chairs
Appendix O	Hints & Kinks – Alternatives and Cool Things Being Done by RPCs
Appendix P	FCC Regulatory Actions

New Planning Documents From The NCC Implementation Subcommittee

Appendix A	Table of Interoperability Channels – Corrected
Appendix AA	Sample Notifications by RPC to Secondary TV Stations
Appendix AB	Sample Cover Letter to Adjacent Regional Chairs
Appendix AC	List of Low Power Channels Subject to Regional Planning
Appendix O	Simplified 700 MHz Pre- Assignment Rules and Regulations
Appendix R	Regional Plan Chart
Appendix T	Sample Cover Letter to FCC
Appendix U	1st Meeting Notification Checklist
Appendix V	700 MHz Implementation Frequently Asked Questions
Appendix W	Inter-Regional Agreement
Appendix X	Process for Handling Unformed Regions
Appendix Y	Sample Unformed Region Waiver Language
Appendix Z	Sample Adjacent Region Concurrence Letter